DOCUMENT RESUME

ED 075 407 SP 006 374

TITLE	Annual Safety Education Review 1971.
INSTITUTION	American Association for Health, Physical Education, and Recreation, Washington, D.C.
PUB DATE	71
NOTE	75p.
AVAILABLE FROM	AAHPER Publication-Sales, 1201 16th St., N.W., Washington, D.C. 20036 (244-25138 $2.25)
EDRS PRICE	MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS	Accident Prevention; *Athletic Activities; Athletic Programs; First Aid; *Health Education; *Physical Education; Physical Education Facilities; *Safety Education; *School Safety

ABSTRACT

This booklet presents articles completed in 1971 by the Division of Safety Education of the American Association for Health, Physical Education, and Recreation. The 11 articles deal with the following topics: a) athletic training programs, b) safety considerations in winter sports, c) safety considerations in gymnastics, d) emergency care, e) athletic training professional preparation, f) safety precautions in planning facilities, g) athletic training in girls' sports, h) problems in water safety, and i) safety for the seventies. The booklet also presents the accomplishments of the Division of Safety Education in 1970-71. The major points include revising priorities for the next 5 years, planning the convention, revising the textbook Sports Safety, and preparing a report on the functions of the division historian. A list of other safety education publications is also presented. (BPR)

SAFETY EDUCATION REVIEW

1971

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION, AND RECREATION

A National Affiliate of the National Education Association
1201 Sixteenth Street, N.W., Washington, D.C. 20036

AMERICAN ASSOCIATION FOR HEALTH,
PHYSICAL EDUCATION, AND RECREATION
A National Affiliate of the
National Education Association
1201 Sixteenth Street, N. W., Washington, D. C. 20036

Order form AAHPER Publications-Sales
1201 Sixteenth Street, N. W., Washington, D. C. 20036
All orders other than those on official purchase
order forms must be accompanied by payment.

CONTENTS

Winter Sports Safety Considerations 1
JAMES G. GARRICK

Athletic Training Programs 4
GORDON L. GRAHAM

Play It Safe! 7
HERB APPENZELLER

Safety Considerations in Gymnastics 12
GEORGE SZYPULA

Emergency Care 15

Athletic Training Professional Preparation 24
SHARON KOSEK

Safety Precautions in Planning Facilities 27
ELMON L. VERNIER

Athletic Training in Girls Sports 30
NELL C. JACKSON

Problems in Water Safety 35
JOSEPH G. DZENOWAGIS

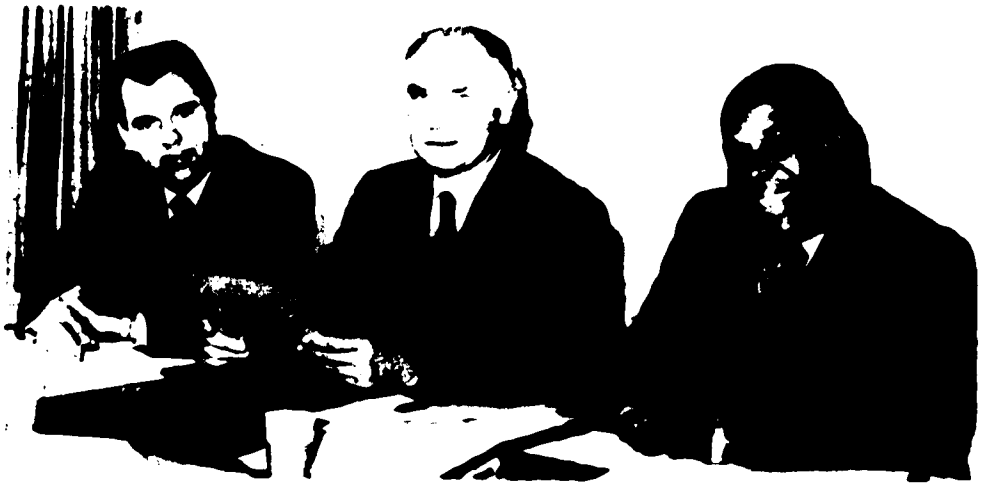
Injury Prevention in Skiing, Snowmobiling 53
MERRITT H. STILES

Safety for the Seventies 64
J. DUKE ELKOW

Accomplishments of the Division, 1970-71 67
NORMAN J. JOHNSON

DIVISION OF SAFETY EDUCATION, 1970-71
EXECUTIVE COUNCIL

Standing left to right: *Robert L. Holland, Edward Mileff, J. Duke Elkow, Marlene Bieber, Dewey F. Lanyston, William G. Helms, C. Everett Marcum, Warren Huffman, William G. Stewart.*
Seated left to right: *John H. Cooper,* consultant, *Kenneth S. Clarke, Joseph G. Dzenowagis, Norman J. Johnson, Patricia H. Fielden,* secretary.
Absent: *Glenda E. Vescolani.*



Kenneth S. Clarke, Mankato State College, Mankato, Minn., *Joseph G. Dzenowagis,* Michigan State University, East Lansing, *Norman J. Johnson,* Lincoln University, Jefferson City, Mo.

Photos by *Carolyn Salisbury,* National Education Association.

Left to right: *Kenneth S. Clarke, Norman J. Johnson, William G. Stewart,* Ohio University, Athens, *Warren Huffman* University of Illinois Champaign, *William G. Helms,* University of Cincinnati, *C. Everett Marcum,* West Virginia University, Morgantown, W. Va.

Joseph Dzenowagis, vice president, and *John H. Cooper,* consultant.

Robert Holland, State Department of Education, Columbus, Ohio, *J. Duke Elkow,* Brooklyn College City University of New York, *Edward Mileff,* Indiana University, Indiana, Penn., *Marlene Bieber,* Doan College, Crete, Neb., *Dewey Langston,* Eastern New Mexico University, Portales.

JAMES G. GARRICK
University of Washington
Seattle

WINTER SPORTS SAFETY CONSIDERATIONS

This winter over five million Americans will participate in two major winter sports activities, snowmobiling and skiing. The first sport can be considered the precocious child of modern technology and the other, a tradition-reared adult that refuses to age. Snowmobiling and skiing have a common requirement for snow, but do not offer a common solution for their injury producing potentials. The problems of remaining safe while being propelled across snow at speeds in excess of 100 mph by a snowmobile (some boasting more horsepower than a compact automobile) are quite different from those encountered in allowing gravity to propel one down a slope on skis.

Modern over-the-snow vehicles had not been invented in 1950 when well over a million skiers utilized the slopes of the United States. In less than two decades, over a million snowmobiles have been produced, most of which can carry two riders and tow another. Thus, those one million vehicles might well involve over three million participants in snowmobiling.

These enthusiasts face the various collision risks encountered by the drivers of any motor vehicle; in addition, because the vehicles have the capability of entering areas previously inaccessible in winter, such problems as an empty gas tank or a dead battery can become life-threatening A nonfunctioning snowmobile includes the danger of inaccessibility.

Fortunately for the snowmobile enthusiast, manufacturer and consumer organizations have been formed which offer guidelines for legislation designed to protect the participant. States such as Minnesota have enacted legislation consistent with the safety of the operator, as well as the goals of conservationist, property owner, and even manufacturer.

Although there are probably over three million active skiers in the United States—many of whom were skiing before the invention of the snowmobile—active participant protection and representation lag behind that enjoyed by the snowmobiler.

It is fortunate that the average pleasure skier requires mechanical assistance in ascending the ski hill. Because of this fact, skiers are forced to confine their skiing to specific areas. Equally fortunate for the skier (although perhaps fortuitous) is the fact that ski area operators have banded together and urged (and generally succeeded in obtaining) legislation designed to standardize safety codes regarding uphill transportation devices.

Thus, "mechanical injuries" such as those resulting from faulty ski lifts, although never distressingly frequent, are now almost nonexistent.

The formation and growth of the National Ski Patrol System in the past three decades has provided a cadre of devoted, selfless, and highly competent rescue and first aid specialists whose services are utilized free of charge by almost every injured skier. But first aid and rescue are not synonymous with safety or injury prevention.

Unfortunately, probably because of the almost total lack of organized protection for the pleasure skier, the promotion and investigation of safety (injury prevention) has failed to mature at a rate commensurate with the profitable aspects of the sport. Despite radical changes in ski techniques, facilities, and equipment, the rate of ski injuries remains remarkably unchanged over the past 30 years.

Unlike the snowmobile, which must conform to certain standards in order to be registered and licensed in many states, ski equipment need only by salable. Although individual reputable manufacturers have tried to increase the safety potential of their products (with safety bindings, for instance), industry-wide standards or, indeed, interest is sadly lacking.

Fortunately, the most readily available adjunct to ski safety currently exists. It involves increasing expertise through formal ski instruction. The Professional Ski Instructors of America fulfills this need.

Less easily attainable, but probably more important, are the continued research and development of safer equipment and the effective utilization of the safety potential of currently available equipment. An industry-wide but independently implemented program of research and standardization would most expeditiously meet this charge. However, if this movement doesn't come about, such programs could effectively be undertaken by organizations representing participants—particularly in view of the recent changes in

the organizational philosophy of the largest of those groups, the United States Ski Association.

Thus, the rapid growth rate of skiing no longer excuses the lack of attendant safety standards and procedures. Indeed, the younger and more rapidly expanding sport of snowmobiling seems destined to provide a model of safety for its older but more reluctant sister sport.

GORDON L. GRAHAM
Mankato State College
Mankato, Minnesota

ATHLETIC TRAINING PROGRAMS

Safety must be a prime consideration for all professionals conducting high school and collegiate physical education activities, interscholastic athletics, and intramural sports activities. Safety emphasis is evident in the planning and construction of facilities, equipment use, and activity organization. In spite of having the best of everything, including supervision, the possibility of an accidental injury is always present. Because the frequency of injury is much higher in sports than in other aspects of the educational system, being prepared to handle the injuries that may occur must have priority status in our schools' planning and development.

If one assumes that the majority of student accidents results in minor physical injuries, discomfort caused by the injury can be alleviated by the immediate and temporary application of emergency care techniques. Because students spend a major portion of their waking hours on school premises, an efficient emergency care program is essential—not only for the protection of the child, but also for legal liability protection for the school administration and personnel. The school should exhibit open responsibility in tending to accidental injuries, a responsibility which has carry-over educational value for the accident victim. Therefore, the provision of emergency care facilities, trained personnel, policies, equipment, and supplies should be a basic responsibility of the school administration.

Facilities

To enhance the safety-in-participation factor, the establishment of an emergency care-athletic training facility is a must for every school. To justify it financially, it

should be a multipurpose facility. At the high school level, such a facility can be both a school nurse's room and an athletic training room. Ideally, this room would be adjacent to activity areas and locker rooms and openly accessible to both male and female students. At the college level, accessibility to all students is important in conducting emergency care procedures, treatment, and rehabilitation. This type of arrangement can financially save on the duplication of supplies, equipment, and personnel.

At any scholastic level, the minimum room size would be approximately 800 square feet, or measure 20 feet by 40 feet. The emphasis, regardless of room size, must be on its accessibility to both male and female students, locker rooms, and activity areas.

Personnel

In having a multipurpose emergency care-athletic training room facility and in having it open to the total school, close cooperation and consistency in emergency care, referral, and treatment procedures is mandatory. The professionally educated, certified athletic trainer and the school nurse must work closely together and share their educational backgrounds in medically applied techniques. In-service education programs are essential if the coaching staff, team and school physician, interested school personnel, and students are to share ideas and methods. Every day the educational process must be furthered by teaching every student how to take better care of himself. The personnel in this multipurpose emergency care-athletic training room facility must constantly be involved in the "teachable moment" process.

Policies

The policies to be established must be cooperatively formulated by the school board, superintendent, principal, school and team physician, athletic director, athletic trainer, school nurse, coaches, teachers, and student representatives. Precise understanding must be established between the school's administrative personnel and the medical team—physician, school nurse, and athletic trainer.

The capabilities of the people in charge will influence the extent of the services rendered. The capable school nurse and athletic trainer will positively influence an increase in services, ranging from immediate and temporary care, to treatment and rehabilitation by a physician. All procedures performed in this facility must be under the direction of the physician in charge.

Equipment and Supplies

In equipping an emergency care-athletic training facility, the following factors must be considered:

1. Room size
2. Experience and capabilities of personnel
3. Extent of services to be rendered
4. School policies
5. Budget
6. Medical supervision

None of the foregoing factors can be overlooked. Every facility will be different. The experience and capabilities of the personnel managing this room will influence most of the other factors. Occasionally, even room size can be changed depending upon location, use, need, and services rendered. Overall, it must be a multipurpose facility of educational benefit to male and female students.

Girls Sports

The above recommendations for health supervision and injury control apply to both girls and boys in school activity programs. With the recent increase in opportunities for girls to participate in school sports, the same attention that has been given to boys must be given to girls. In this regard, the essential considerations seem to be accessibility to the athletic training room and professional preparation of the overseeing athletic trainer.

The former problem may be resolved through improvisations, but the latter is completely a matter of standards and opportunity. Too few boys programs enjoy the services of the professionally educated, certified athletic trainer. It could be timely at this stage in girls sports development for those responsible to include professional preparation of qualified athletic trainers in their immediate goals and plans. For further information, contact the National Athletic Trainers Association, c/o Gordon Graham, RPT, Mankato State College, Mankato, Minn. 56001.

HERB APPENZELLER
Guilford College
Greensboro, North Carolina

PLAY IT SAFE!

We all realize that we are in a profession that produces injuries. In fact, more accidents occur in athletics and physical education than in any other school-related activity, and as a result, there is more litigation in the area of physical education and athletics. There is another problem that I think is important for us to think about. In many cases we wait until a serious accident takes place and then we try to correct or prevent another from happening. After the Wichita State and Marshall University tragedies, my desk has been flooded with materials from FAA, private charter companies, and airlines, trying to set guidelines for safe air travel. We should be aware of situations and prevent accidents instead of correcting situations after they occur. I would like to discuss three danger areas in physical education and athletics in an effort to emphasize prevention rather than correction.

Supervision

First is the matter of supervision. The unsupervised class has been and continues to be a nemesis of the physical education teacher. For some strange reason, teachers can't resist the temptation to go out of the room or off the playground for just a moment. These teachers feel reasonably certain that nothing will happen if they leave for only a few minutes. The tragic fact is that it only takes a split second for accidents to happen. They often do just when the teacher is absent.

---

*This article is based on an address to the Division of Men's Athletics during the AAHPER Detroit Convention.

Teachers sometimes leave their classes to talk with a salesman who happens to drop in. They answer telephone calls that could easily wait until later. They visit with other teachers, talk with the principal, schedule events, or ask for a cigarette or soft drink, or do routine things.

All these things could wait for a more opportune time. Pupils can answer the telephone for the teacher; salesmen can wait until later. Many teachers [illegible] appointments with [illegible] during valuable class time.

The court has made its feelings known on the practice of unsupervised classes.

The teacher assumes a great risk when leaving the pupils unattended for any reason, and the sooner this idea is brought home the better. Administrators should adopt rules and regulations regarding all situations in which teachers feel obligated to leave their pupils alone. The administrator must insist that these rules are enforced or be prepared to spend days in court. As long as teachers leave their classes alone for any reason, injuries that occur will offer the best reasons for litigation. How much better it is to be safe than sorry.

Instruction

A second important area is instruction. Isn't it tragic and even sad that the professional teacher may now be forced to defend his actions before a group of well-meaning but often uninformed men and women that compose the jury. Is it really possible that such a jury composed of people unfamiliar with physical education could award a pupil $15,000 for an injury in a roll-over [illegible]? [illegible] $15,000 to be given to a young boy in a wrestling injury because the teacher failed to anticipate the exact moment when an injury was about to happen? Physical education teachers are in a precarious position in many instances and usually deserve our sympathy—but often they are not blameless. In too many cases, they have had to assume the responsibility for their negligent actions regarding instruction. The author visited several teachers who were introducing new units in tumbling and gymnastics to novices. After a brief instruction period, these teachers asked their classes to attempt complex stunts with little regard for the safety of their pupils. After [illegible] minutes of work on forward rolls, a teacher in one school had the members of his class diving over six or seven pupils with a forward roll. The fact that no one sustained a fractured skull or a broken neck is a miracle. It is obvious that the court will not tolerate incompetent instruction when injuries result. Teachers who consistently insist on advanced activities for unskilled

youth will and should expect a day in court when children suffer serious injuries. It is much safer to begin with something simple and move to the more difficult. The wise teacher will thoroughly and patiently prepare his pupils for the more advanced stunts and games in his program.

A realistic and positive approach is for the teacher to take time to warn all his pupils about the danger of the activities they are about to undertake. The court will give consideration to the fact that sufficient warning was made when injuries occur. It is better to eliminate activities when no one is qualified to instruct than to continue these activities when no one is qualified to teach them.

Facilities - Equipment

The third area of concern is defective equipment and unsafe facilities. Several years ago after our football season was over, I went to the equipment room with a sporting goods salesman who had sold us our headgear. I complained about the unusual number of players on our team who had received head injuries during the past season. "Did you check the knot in the top of the headgear?" he asked. "If it isn't tied, a player will have a chance of sustaining some type of head injury," he cautioned. To my amazement, I found that in every headgear belonging to a player who received a head injury, the knot was untied. From that day on, our head injuries decreased dramatically as we required each boy to check the knot before every practice and game. This is but one illustration of a simple thing that when observed, can limit needless injuries.

From time to time we discovered that the padding on our seven-man-sled had worn thin. At times our men were actually hitting the board itself instead of the usual padding. In another instance we practiced on a field that had a tremendous rock in the middle of it. Careful inspection would have detected this potential hazard. While running on the same field, our players were trying to avoid a right field foul marker left over from the past baseball season. We made no attempt to move it until a hardrunning fullback was tackled out of bounds and suffered a neck injury when he collided with the iron pipe.

Frequently we would find that our wire screen was defective after a foul tip or wild throw went through, causing the spectators sitting behind the backstop to scatter.

The dangerous defects we have observed are too great to list. They seem to spring up around athletic fields and equipment. It is necessary to expect the maintenance people or someone else to make inspections and corrections

but the responsibility needs to be delegated to a specific person. It is really a simple matter to take the time and effort to check certain pieces of equipment daily, others weekly, and still others monthly or yearly. The [illegible] of inspection depends on the nature and type of facility and equipment used. School people should make a habit of checking these things regularly. They may be amazed at what will be found but even more surprising will be the number of accidents prevented. Keep a systematic record of inspection and use the information in a positive way. This routine inspection will pay off. It won't be as glamorous as deciding a touchdown play, but the knowledge that players are being protected will be sufficient reward.

The majority of schools with dangerous bleachers will undoubtedly cling [illegible] to the time-worn but still effective [illegible] of governmental immunity. The fact that the [illegible] spectators a moral obligation for safe facilities does not seem to bother many school officials who nonchalantly [illegible] aside the problem by stating [illegible] that they are protected by insurance or by the doctrine of immunity. What an attitude for educators to take!

Recently several administrators were asked who was responsible for inspecting the athletic field and facilities. Believe it or not, very few could name the one responsible for the safety of the facilities. Some thought it was the duty of the coach, others pointed to the principal and others felt it was the obligation of the maintenance department. Unbelievable but true!

Too many innocent spectators become the victims of pure unadulterated negligence. It is [illegible] true that this area is considered unimportant to [illegible]. School boards must insist on adequate inspection [illegible] that cover athletic equipment and facilities. [illegible] responsibility for periodic inspection by a designated department or person is imperative. The fact that [illegible] is relatively new should not exclude inspection [illegible] can occur at any time.

Regular and thorough inspection should [illegible] all facilities of the athletic program such as tennis courts, baseball backstops, [illegible] and other similar facilities.

Principals and athletic directors should [illegible] [illegible] at all home games. [illegible] parents and [illegible] the [illegible] closer look at their [illegible]. How [illegible] when several [illegible] with young children [illegible] the importance of [illegible] control [illegible] safety [illegible].

A new trend is developing that is certain to present administrators with litigation. When heated rivalries exist between schools, the person responsible for the safe conduct of the games should take every precaution to prevent riots, fights, and other disturbances. If the situation has been explosive in the past, the court will expect the administrator to take every precaution possible. The number of policemen required will depend on the size of the crowd, the nature of the rivalry, and other pertinent facts.

In like [illegible] r, the c[illegible] rt will de[illegible] d that official[illegible] be given prote[illegible] from spectators, [illegible] nes, and [illegible] alike. Failur[illegible] re to [illegible] afet[illegible] officials [illegible] to litigation [illegible] are treated [illegible]

The pict[illegible] nd does [illegible] get [illegible] mplicated f[illegible] those [illegible] author[illegible] but care[illegible] [illegible] proper pre[illegible] tions [illegible] manag[illegible] the dang[illegible]

[illegible] ety is [illegible] an impo[illegible] le [illegible] pay attent[illegible] [illegible] on, in [illegible] action, [illegible] pme t, [illegible] acilities [illegible] [illegible] ccur. If we rea[illegible] that [illegible] d happen to [illegible] we [illegible] prevent [illegible] juries and [illegible]

GEORGE SZYPULA
Michigan State University
East Lansing

SAFETY CONSIDERATIONS IN GYMNASTICS

Gymnastics teachers and coaches are becoming increasingly aware of safety measures to their sport through the clinics, workshops, and [illegible] books and articles stressing safety. Equipment companies [illegible] continually redesigning their apparatus for greater [illegible] They are producing mats for placement around apparatus to provide flat resilient surfaces on which to land or dismount. Most of these mats are 4 inches thick [illegible] with the latest regulations. Also, there are crash mats which are 8 to 10 inches thick, similar to the landing pits used by high jumpers and pole vaulters [illegible] the last [illegible] years, the apparatus for boys and girls has become more resilient, making performance of skills both easier and safer. The stage has been set for a [illegible] activity. Now it is up to the teachers, coaches [illegible] performers.

There are three areas of concern:

1. The performer must be prepared [illegible] through stretching and strength calisthenics, [illegible] tumbling, and balancing on the mats or t[illegible]line.

Proper amounts of flexibility and strength are important in gymnastics performance, [illegible] the degree to which they are needed is difficult to [illegible] The overflexible gymnast can suffer injury if [illegible] there [illegible] which exert a greater force [illegible] his joints [illegible] strength can allow. Conversely, the overmuscled [illegible] (contrast to rarity, [illegible] the sport promote the little [illegible] properly flexible performer) can sustain injury [illegible]

[1] See the following books written by George Szypula: Tumbling and Balancing for All (Dubuque, Iowa: William C. Brown Co., 1968) and Trampolining [illegible] Wadsworth Publishing Co., 1968).

not stretch enough to absorb the force of performing. Regardless of the student's age, this is a problem. Even the elementary school child can show signs of overflexibility or overstrength. This is the time to recognize and remedy the condition. The physical educator or coach should not rush the young gymnast into the weight room for a hasty solution that could backfire. Instead, he should promote the student's strength and or flexibility through an intelligent program of remedial calisthenics and gymnastics. A program of calisthenics preparation for gymnasts follows.

I. General Warm up
Running, jumping, or hopping

II. Trunk Bending
1. Bending forward and backward or
2. Rotation

III. Leg Stretching
1. "L" sit straddled - bend forward
2. "L" sit legs together - bend forward
3. Sit with legs bent, soles of feet together and knees apart
4. Hurdle sit - both sides

IV. Shoulder Stretch
"L" sit with arms straight back and thumbs turned out

V. "Pretzel" bend

VI. Backbend (bridge)

VII. Splits and Straddle
Left split, to straddle, to right split

VIII. General Loosening - Same as I. above

Basic tumbling, balancing, fundamental drops, and tumbling on the trampoline can develop the body coordination and control needed to perform apparatus skills.

2. Proper progression is important to the gymnast. From the above preparatory program, the gymnast can safely progress to the apparatus. Progression also refers to the advancement from basic to more complex skills. Students who are not capable should not be permitted to move to the more difficult skills.

A performer can be prepared for advanced skills on the apparatus, tumbling, and trampolining through flipping into a crash mat. Besides improving the performance of

the skilled gymnast, this mat enables the inskilled tumbler to safely do forward and backward rolls. After several sessions on the crash mat, these youngsters are learning over rudimentary forward somersaults to their feet or seat, not rolls but aerial turns. The security the mat provides promotes relaxation and confidence. The performer should not switch to the apparatus, regulation mats, or trampoline before he is able to remain on the crash mat for awhile. There is no hurry.

Proper spotting techniques are essential. They are not among the most important considerations in discussion of safety. The development of spotting ability requires as much time as the development of the skill. Progression is important here, also. The beginning spotter starts by spotting stationary skills, the headstand and handstand. After much practice he proceeds to spotting a forward handspring from one foot from a run, and then the standing backward handspring, and the backward handspring from a run. Another example of developing spotting techniques in progressive steps can be shown on the horizontal bar. The spotter lifts the performer onto and over the bar many times, he assists him in circling around the bar in various ways; he assists him into and through handstands, and catches him on flyaway and other dismounts from the bar.

Obviously there are many more skills to spot. The development of skill in the art of spotting should be slow and methodical. By manipulating the performer through the skill, the spotter gives him the "feel" of the skill and promotes his confidence. With this feeling of security, the performer can make rapid progress.

In addition to hand spotting, an important skill to develop is spotting with an overhead rig and with a hand belt.[2]

The psychological as well as the physical aspects of the performer should be considered. The instructor should know his student. He should sense when he is afraid, since fear blocks performance. He should discover why, and attempt to eliminate or alleviate the cause.

Safe performance should permeate all gymnastics activity.

---

[2] Ibid.

EMERGENCY CARE

Introduction

At the 1971 AAHPER Annual Meeting in Detroit, the Safety Education Division broke new ground in the area, "Emergency Care—New Concepts and Programs." The featured speaker was Dr. C. Robert Clark, an orthopaedic surgeon from Chattanooga, Tennessee. He came as the official representative of the American Academy of Orthopaedic Surgeons which, through its Committee on Injuries, has been instrumental in significantly upgrading the education of police, firemen, ambulance attendants, and other emergency care personnel throughout the country for the past six years. Doctor Clark is an avid speleologist and coordinates (voluntarily) all cave rescues in the Chattanooga area, as well as the more usual emergency care problems. He has been cited for community service a number of times, and is coordinator of emergency medical serices for the U. S. Tennessee Valley Authority. He has conducted several of the Academy's courses on emergency care in Chattanooga.

The response to his presentation was enthusiastic, confirming the division's contention that AAHPER members are professionally related to, and ready for, this concern. First aid courses are offered in many high schools and most colleges, and are required in many college curricula. The teachers of formal courses usually come from the fields covered by AAHPER. However, because of certification requirements, first aid courses must be the same everywhere, for every age, for every purpose.

Doctor Clark's message was motivating because it involved

1. [illegible]ing a dynamic approach to professional preparati[illegible]rough college and school programs

2. [illegible]hing the standard first aid course in a manner that [illegible]es the need for ba[illegible]derstandings, yet brings in [illegible]oncepts and techniques of emergency care

3. [illegible]ading or beefing up an advanced course that includes [illegible]unity organization as well as concepts and techniqu[illegible]

4. [illegible]eloping workshops for crash remedial education for [illegible]rvice personnel

5. [illegible]ing a program that leads to certification of an emergen[illegible]edical technician (a person who will be spending time [illegible]ularly—as a volunteer or not—in rescue and emergen[illegible]are services).

Unfortunately, this Review cannot bring Doctor Clark's message to the reader verbatim. He utilized a 16 mm film into which he had spliced a series of TV camera film clips of emergency care and rescue episodes. The division thus turned to the next logical source for capturing a portion of his remarks. The Academy's textbook, Emergency Care and Transportation of the Sick and Injured, was published in September 1970, and will soon be a staple text for advanced first aid classes in schools and colleges. The U.S. Department of Transportation adopted this text for preparing lesson plans to be used in compliance with the Highway Safety Act for improving emergency services. The book was prepared by the Academy's Committee on Injuries with assistance of representatives from the Committee on Trauma, The American College of Surgeons; Commission on Emergency Medical Service, American Medical Association; Committee on Emergency Medical Services of the National Academy of Sciences-National Research Council; The U.S. Army Medical Training Center, Fort Sam Houston, Texas; The American National Red Cross; The Hospital and Ambulance Services Branch, Division of Emergency Health Services, U.S. Public Health Service; and the Emergency Medical Division, Department of Transportation.

The following pages are the foreword and chapter I of this new text. The foreword emphasizes the many aspects of professional involvement, while chapter I emphasizes the role of one who is specially educated to provide emergency care on a regular basis, as a volunteer or as an allied health professional. The reader is encouraged to obtain the complete text for review and utilization ($4.95, prepaid) and to be alert to future AAHPER efforts in this field. The text is available from the American Academy of Orthopaedic Surgeons, 430 North Michigan Avenue, Chicago, Illinois 60611.

EMERGENCY CARE AND TRANSPORTATION OF THE SICK AND INJURED

Foreword

The emergency medical technician performs a unique service which cannot be rendered by any other individual or group. Through effective application of his skills at the scene of an accident or illness, he is in the enviable position of being able to save lives and prevent or alleviate suffering. Although there are many competent emergency medical technicians, their numbers are by far too few to fill the national need for their services. It is most important not only to increase their numbers but also to provide a standardized educational approach for them that will help establish a uniform standard of competency in this vital allied medical profession. With this goal in mind, the American Academy of Orthopaedic Surgeons decided to develop a standard textbook for use by both student and teacher.

In 1964, Sam W. Banks, M.D., then chairman of the Committee on Injuries of the Academy, initiated a series of concentrated three-day courses for training emergency medical personnel, which the Committee on Injuries has conducted each year since then and which it plans to continue. By 1967 certain lessons had been learned and an obvious, but formidable, undertaking presented itself as being essential to overcome difficulties encountered in conducting the courses. The undertaking which was proposed to the Academy was that the Committee members compile and write a text to provide a standard educational reference for those engaged in this work, particularly for those just entering it. Requirements for such a text were agreed to be: (1) that it be comprehensive enough to meet the full requirements of the training course, (2) that it be clear enough to be understood by those with limited previous training; and (3) that it be sufficiently illustrated to provide not only basic factual information but in some degree to teach the skills involved.

The broad spectrum of medical subjects to be presented demanded that knowledgeable specialists be involved to insure the major objectives of accuracy and completeness. It was recognized that no one organization could furnish all the necessary personnel. The names of the contributors, consultants, and task forces participating attest to the thoroughness with which the objectives were pursued. Medicine and its allied services joined together unselfishly to provide this textbook, the need for which they recognized to be vitally important.

It was the consensus of those involved that a text alone would be of limited value. All agreed that it must be implemented within the structure of an educational system. In my own opinion, the educational system needed should parallel the arrangements of those already in existence for various allied medical services. It must embody the necessary subject material and must be taught by those with recognized teaching ability. The instructors must be professionally familiar with the information to be presented and be aware of the educational level and methodology needed to alter significantly the behavior patterns of the individual to be taught.

A formal educational program of sufficient depth and duration is necessary to achieve vocational status for the emergency medical technician. The ultimate goal, of course, is a core curriculum for a community college whose graduates' competency would be greater than that required by minimal standards. It is hoped that this text, along with lesson plans which have been developed in concert with it, will be utilized on a national basis for this purpose.

It has been medicine's responsibility to develop the methods of education, to create the certifying process, and to recognize the vocational status of persons trained as emergency medical technicians. It is, however, the responsibility of those at state and local levels of government to provide facilities for both initial and continuing education in order to meet minimum standards of certification.

Chapter 1

Orientation for the Emergency Medical Technician

Introduction

Emergency medical technicians serving on ambulances have the greatest opportunity of any segment of society to alleviate human suffering at the scene of accidental injury or sudden illness and during transportation to a hospital. With proper training and experience, ready availability of equipment and supplies, radio communication, and a vehicle designed to meet the needs of the injured or sick, the Emergency Medical Technician (the EMT) is equipped to serve as the most valuable lay member of the medical care team outside the hospital.

Whether injury or sudden illness occurs at home, at work, on the highway, or at a recreational area, there is rarely a physician, a nurse, or a trained emergency

medical technician at hand to provide initial care. Even though parents, friends, or bystanders may have had instruction in first aid, they—and even policemen, firemen, and workers in public utility agencies, who may have undergone more extensive training—are limited in their ability to sustain life in victims of life-threatening conditions until professional assistance is available. This is due in large part to the fact that they do not have the equipment, supplies, or means of transportation that may be necessary for survival and safe delivery of the patient to a hospital. It is thus essential that the well-qualified EMT be able to assess the quality and effectiveness of first aid already rendered by those with less training and to assume primary responsibility immediately and tactfully, enlisting others' assistance to the extent that it may be required.

The major portion of this textbook is devoted to instruction in actual care of patients with specific injuries or illnesses, at the scene of onset and during transportation to a medical facility. To learn to administer proper care efficiently, the student must constantly be mindful of the ways in which instructions contained in a number of chapters not directly concerned with specific injuries or illnesses are important to the goal of saving lives; and he must learn to avoid or reduce the complications that might prolong recovery or result in additional disability. Thus, in the emergency care of any patient, to be able to judge the care that is needed and to render that care with the equipment and supplies at hand is not enough. The EMT must also be thoroughly familiar with the usefulness and limitations of the transportation vehicle, communication equipment, and every item of supplies and equipment available to him. He must combine with his medical skills and practices the art of a professional samaritan in every endeavor involving patients, relatives, bystanders, associates, members of emergency departments, administrative and legal authorities, and his employer.

Attributes of the Emergency Medical Technician

The attitude and conduct of an emergency medical technician must at all times reflect a sincere dedication to serving fellow human beings. His morals and ethical standards should be high. He must seek always to increase his knowledge and skills, to perform to the best of his ability with full recognition of his own limitations, and to accept and benefit from constructive criticism and advice.

The EMT must earn the respect and recognition of others as a responsible member of the medical team. He must take pride in his personal appearance, his technical knowledge, and his ability to render care. He must

perform under pressure with composure and self-confidence. He must discipline himself to control his emotions, to be sympathetic to the abnormal or exaggerated actions of those under stress, and to exert reasonably and firm leadership in carrying out measures that insure the survival, safety, comfort, and confidence of the patient from the time he arrives on the scene until the patient is delivered to medical members of the team.

Assumption of Responsibility

Regardless of the circumstances encountered when he responds to an emergency call, the EMT must recognize that from the moment he first attends a patient he assumes a responsibility to provide emergency care to the fullest extent of his ability until a physician or other qualified person at the scene or at a hospital assumes responsibility for continuation of care.

If police or other authorities have not assumed control of the situation at an accident scene, the EMT's attitude and leadership qualities will be crucial to gain control and support from relatives and bystanders. Such people are usually responsive to direction and want to help, but they must be told briefly and clearly exactly what they should or should not do. A calm, decisive manner will create the spirit of effective teamwork necessary for efficient action.

The EMT will often be confronted with situations that tax his ability to remain calm and to perform effectively. Great fortitude is necessary if one is to witness horrifying events and yet exhibit self-control and respond effectively to the suffering of others. Such an attribute can be developed only through training, experience in dealing with all degrees of physical and mental distress, and especially through an unswerving dedication to serve humanity. Even the most experienced physician or the combat-hardened medical corpsman may find it difficult at times to submerge personal reactions and proceed without hesitation to release patients from life-endangering situations, administer life-support measures to the mutilated, or recover the remains of those mangled in violent highway accidents, aircraft disasters, or explosions. The EMT must be prepared to face these situations with equanimity and to fulfill his responsibility as a member of the medical team.

Responses to Emotional Reactions to Injury or Sudden Illness

A high percentage of patients attended by the EMT will be rational and cooperative, and much of their concern

will be relieved by calm and efficient care. The EMT will often believe that a given condition does not constitute an emergency, but neither actions nor words should reflect such an opinion. Although a doctor may later agree and dismiss the case, the doctor is qualified to do so; the EMT is not. For both ethical and medicolegal reasons, it is incumbent on the medical profession that a doctor examine all patients received and judge the degree of medical need of every "emergency" patient. The EMT must recognize that even the most subtle symptoms may be early signs of catastrophe and that symptoms of many illnesses may be similar to those of alcoholism, drug abuse or withdrawal, hysteria, or other conditions. A patient's complaints must be accepted at face value and the EMT must care for the injury or illness to the best of his ability until he is relieved of further responsibility by a physician or a member of the staff of a medical facility.

Personality traits are influenced by many factors. Members of some national groups are highly emotional and demonstrative, even for what may seem trivial cause, whereas those of some other groups are stoical and undemonstrative, even in the face of serious injury or illness. Social and economic background, dependency on others, immaturity, senility, mental disorders, alcoholism, drug addition, reaction to medication, nutritional status, and chronic disease may substantially influence a person's reactions to acute injury or unexpected illness.

Although the emergency medical technician cannot be expected to know the underlying factors that might trigger abnormal emotional responses, he must quickly and calmly appraise the actions of the patient and of relatives and bystanders and gain the confidence and cooperation of all concerned. Courtesy, proper tone of voice, sincere concern, and efficient actions in examination and administration of care will go far in allaying anxiety, fear, and insecurity. Reassurance, rather than abrupt dismissal, chiding, or accusations, will engender confidence and gain cooperation.

The patient should be given the opportunity to express his fears and concerns, many of which may be lessened on the spot. His concern may be for the safety or well-being of others involved in the accident, or may be related to damage or loss of personal property. Responses to such concerns must be discreet and diplomatic, with special consideration to the time and place when disclosure of death or critical injury of loved ones might be most appropriate.

Some patients, especially children and confused or aged persons, may be terrified or feel rejected on separation from family members. Other patients may prefer to relieve family members of the stress of witnessing their disability or pain. The extent to which relatives participate,

including accompanying the patient to the hospital, must be decided on the basis of the best interests of the patient.

Attention to religious customs or needs may be of great importance, not only to the patient but also to his family. Convictions against administration of drugs or blood or the desire to keep religious medals may produce fear and concern. The need for religious counsel or baptismal or last rites, if death is imminent at the scene, must be respected.

In case of death, the body of the deceased must be handled with respect and dignity. Exposure of the body must be minimized, and it must be recognized that changing its position or location at the scene or transporting it from the scene may not be permitted except on permission of the coroner or other authorities.

Relationships with Hospital Emergency Departments

There is no better way in which the EMT can learn to appreciate the extent to which his care influences full recovery or aids in reducing the degree of lasting disability than to observe the continuation of care by staff members of the emergency areas of a hospital. The extent to which he gains this knowledge is dependent upon his sincerity of purpose, his eagerness to improve his practices and skills, and his willingness to accept advice and constructive criticism. On demonstration of these attributes, the EMT can enjoy a close working relationship with hospital staff members.

While the physician is responsible for the actions of members of his staff, and may not be in a position to permit the EMT to participate actively in procedures, much can be learned through direct observation, instruction, demonstration, and assisting to the extent permissible. This experience serves to emphasize the importance and benefits of proper initial emergency care and effective transportation, as well as the consequences of inadequate care, or misjudgment.

As an observer, the EMT will become familiar with equipment used, the functions of staff members, and the policies and procedures in all emergency areas of the hospital. He will become more expert by observing methods of resuscitation, handling of the unconscious, management of the mentally disturbed and unruly, the delivery of babies, and care of the newborn infant and mother. In addition, he will keep abreast of medical advances and of the design and use of new equipment.

It is rare that a physician is present at the scene of injury or onset of unexpected illness to give on-the-spot

direction to the EMT. In addition to the physician's role as instructor in the didactic subjects of this textbook, it is in the emergency areas of the hospital that he can most effectively train emergency medical technicians in the practical aspects of care by demonstration of techniques of actual patient care. In this way the EMT becomes more proficient in medical terminology and in interpretation of signs and symptoms of injury and disease. The physician also becomes familiar with the EMT's capabilities. Such familiarity can make more effective voice communication between the scene, the ambulance, and the emergency department, by means of which the physician can be of great assistance in recommending emergency measures that may mean the difference between survival and death.

The EMT will find the staffs of emergency areas of the hospital eager and willing to improve his skills and efficiency, not only during his initial training but throughout his career. A close rapport among all concerned will assure optimal care and afford the emergency medical technician the opportunity to discuss his problems, benefit by experience, and better fulfill his role as a member of the medical care team.

HARON KOSEK
of Washington
Seattle

ATHLETIC TRAIN[illegible]
PROFESSIONAL [illegible]RATION

Contrary to popular opinion, [illegible]ners are not masseurs or water boys. The [illegible]ional people who are thoroughly educated to me[illegible]tandards set by the medically recognized Nati[illegible]Trainers Association (NATA). These stand[illegible]passing the National Certification Examinatio[illegible]tic trainer works closely with the medical st[illegible]educators, coaches, and students who are en[illegible]sports during the school year.

An important aspect of a trai[illegible]b is the development of conditioning and testing pro[illegible]to evaluate the condition of each athlete. The devel[illegible]nt and supervision of reconditioning programs under the direction of a physician for athletes who have sustained injuries is another phase of the trainer's work. Athletic trainers are also responsible for administering first aid. Knowledge of organizational and administrative procedures, budgeting, and record keeping is an asset.

Today, men and women can prepare for a career in athletic training and meet the standards for certification by passing the National Certification Examination and one of the following:

a) College preparation in an athletic training curriculum approved by the NATA and two years of experience under the direct [illegible]sion of NATA approved supervisors.

b) Col[illegible]ge preparation in a [illegible]apy curriculum with a major or m[illegible]dth and/or physical education, a valid t[illegible]certificate, and two years of athletic training experience under the direct supervision of NATA approved supervisors.

) On the- ... tr ... s minimum) ... the ... sup ... tied NATA ... be ... college ... tter of recom... dation ... the ... iiate supervi... At present ... here ... ies with NA... ved athleti ... rain:

Lamar State ---- ... Texas
Mankato State -------- ... Minnesota
Indiana State --------- ... te, Indiana
University of New Mex ... ie, New Mexico
Purdue University --- ... Indiana
Westchester State --- ... er, Pennsylvania

Several other unive... he process of hav-ing athletic training prog... but there is a greater demand for certified ath... iners than the educational centers can no... r this reason, three tracts have been app... NATA.

I am unsure if wome... being accepted in the athletic training co... know that women interested in this field ... I gained the necessary experience by ... graduate course on the care and prevention ... and by practicing taping techniques in t... the training room ... women were not al... se the facility. The men my class were requir... e hours a day in the training room, but I cou... techniques on my own teammates.

A sound educationa... s necessary because trainers learn through tr... Men gain training experience as student trainer... igh school and college levels, but women do not hav... portunity. I have relied mainly on my physical thera... ining since the opportunity for practical experience ... available.

Previous competitive expe... is not a requirement for athletic training, but it doe... individual to understand the athlete's motivation an...

Teaching experience is ve... rtant. The trainer instructs students in conditioning ... habilitation programs, die ... hygiene, injury pre... and many other subjects. ... is qualified to instr... ealth and physical education ... With a backgro... sical therapy, ... is qualified to supervise in a... orrective physical education class and work wit... apped students. ... is also involved in the supervi... training of student athletic tra... , aides, or assi...

Aside ... m educational back... er important ... of qua... ation include ... of a trainer. ... most ... nt ... good health, (2) ... appearance ... nor, ... understanding, (... tience, ...

Long [illegible] of hard work, including [illegible] any responsibilit[illegible] and road trips, will sap [illegible] even the healthiest individual. Neatnes[illegible] should be the trademark of the trainer [illegible] means being in good physical condition [illegible] letic trainer should reflect the principle[illegible]

A favorable quality in any individua[illegible] of humor, but in the training room and on [illegible] court it is especially important. The self[illegible] trainer displays, and the humor and enthu[illegible] he speaks will set a favorable emotional [illegible] gency situations, the trainer can break the [illegible] few well-chosen words.

Since the trainer works with many students [illegible] to-one basis, he is in an ideal positio[illegible] for [illegible]. One of the most important qualities [illegible] trainer is understanding. The most important ther[illegible] students is talking confidentially to someone [illegible]. This trust is developed through formal and inf[illegible] ciations. Unselfishness of time and self is [illegible] becoming a good trainer.

Students are curious about w[illegible] they are [illegible] exercises, why it takes a certain amount of [illegible] thing to heal, or why they are being tested. [illegible] much more willing to do what they are told w[illegible] the reasons why.

Trainers must be willing to attend conventions, clinics, and short courses to keep up-to-date [illegible] developments in athletic training and allied fields. [illegible] budgets are not as large as one might wish the [illegible] the trainer must learn to improvise whenever [illegible] must never accept inferior quality supplies because [illegible] are less expensive.

If you like to work a straight eight-hour [illegible] weekends free, a job without numerous interruptions and frustrations, athletic training is not for you. If you like to travel and enjoy dealing with people, that [illegible]. If you really enjoy watching athletic competition [illegible] less days of practice, you are on your way. And [illegible] gives you a thrill to see your patient's progress [illegible] ice, compression, and elevation stage to full [illegible] privileges without restrictions, you are in the right field — athletic training.

ELMON L. VERNIER
Baltimore City Public Schools
Baltimore, Maryland

SAFETY PRECAUTIONS IN PLANNING FACILITIES

A sizable proportion of the total cost of a new public school plant is allocated to physical education facilities. This portion amounts to about 12 to 15 percent for the average elementary school, and 20 to 25 percent for the average secondary school. Therefore, it is essential that the planning of facilities involves qualified physical education personnel who can interpret various facets of the program as they relate to the construction of facilities.

Of utmost importance is the expert guidance the physical educator can give in relation to safety. Architects, as well as others involved with facility planning, are sensitive to safety precautions. However, they are not always familiar with the safety problems of physical education and recreation programs. For over 20 years it has been my privilege, along with other physical education staff members, to work with many different architects in planning facilities. The architects have been most receptive to planning suggestions which will insure optimum safety. This sort of cooperation has resulted in the construction of over 50 gymnasiums and playfields with careful regard for safety precautions. Yet, we find that mistakes or omissions have been made by contractors which necessitate correction and, consequently, additional cost to the city.

For example, it was recommended that the sideline of a football field be a minimum of 20 feet from a 42-inch fence separating the spectator stands from the field. The final construction allowed only 8 feet. At an additional cost of over ten thousand dollars, the field was leveled on the opposite side to provide a safe distance from the sideline to the spectator stands.

At other locations corrections were necessary even though proper precautions were taken in the planning stages. These involved extending the width of a door, knocking out

a portion of a wall to provide safe ingress and egress, refinishing slippery floors in locker and shower rooms, etc. Therefore, it is highly important that physical educators give careful attention and exert proper follow-up beyond the planning phase.

What are some of the important safety measures which may be overlooked by the architect or the generalist involved in planning?

Attention must be given to the glare-producing properties of artificial and natural lighting. A current practice is to eliminate natural lighting in air-conditioned facilities. If windows are installed, they should be constructed with nonglare and nonshatter tinted glass.

Some architects will insist on large glass panels to enhance the aesthetics of the building. For example, one of our architects was enthusiastic about using glass panels for one wall of a swimming pool. The school is located in an inner city area subject to frequent vandalism.

Artificial lighting fixtures should be recessed and protected against breakage. Too often the contractor will install hanging lights that are a safety hazard.

An important safety measure is the installation of emergency lighting in the swimming pool area. We learned this the hard way when the power went off one evening while the pool was occupied by beginning swimmers.

Another example, discovered recently at one of our new high schools, was the error of installing a hanging light fixture directly over the deep end of the swimming pool. In order to replace the light, a maintenance man had to climb a high ladder and lean out over the pool. A request was made to relocate this fixture.

Too frequently a horizontal bar is installed near a door or an entrance from a corridor.

Spectator stands, usually purchased on a bid basis, often have poor quality wood and are difficult to fold and unfold safely. Some are constructed so that debris can collect underneath and be easily ignited by dropped cigarettes. This occurs usually in connection with stands erected adjacent to playing fields.

Caution should be taken in selecting safety devices for chains attached to swings or tires.

Fixtures for guy ropes or chains to raise and lower backboards, rings, climbing ropes, etc., should be located where they will be safely accessible to users. Too often they are installed above the highest seat of the spectator stands or at a height which necessitates climbing on a chair to reach them. Whenever possible, electrically operated hoists should be provided for heavy apparatus such as basketball backboards.

Wall mats should be installed at the ends of basketball courts which extend into the area of the stage of an auditorium-gymnasium.

Radiators should always be recessed into the walls.

Careful attention must be given to the planning of corridors, entrances, and exits to provide the maximum safety in moving large groups of students.

Shower and locker room floors should be made of nonskid materials.

On the playground and playfield the following safety precautions must be taken:

1. Apparatus should be free from protrusions such as bolts and extended pipes.
2. Safe matting under apparatus is essential.
3. Apparatus must be located in an area free from pedestrian traffic.
4. Adequate fencing is essential, especially adjacent to streets and residential areas.
5. Baffles are preferable to gates.
6. Shot and discus areas should be located away from all lines of traffic.
7. A protective 4-foot fence is desirable at a safe distance from and back of a swing set.

One cannot be too cautious in the planning of physical education facilities. I have referred to some of the more important safety measures. You may probably thought of others pertinent to your own activities. It is my hope that this presentation will encourage you to "think safety" and make use of every plan with all precautions possible so that the school playfield will truly be a safe place to play.

NELL C. JACKSON
University of Illinois
Urbana

ATHLETIC TRAINING IN GIRLS SPORTS

Several years ago we talked about expanding opportunities for girls and women to participate in competitive programs. Today we have expanded ... many sports ... girls and women ... state, regional, national, and international ... we ... successfully ... our ... of our pro... experience in protecting girls from ... The profession has opened new ... to meet ... serving as an athletic trainer for girls.

By their nature, sports activities ... injury. All-out exertion, situations requiring body contact and play involving the striking and throwing of missiles establish hazards that are either directly or indirectly responsible for many of the injuries suffered in competition.

There is a general consensus among coaches that the rate of injury can be substantially decreased by proper preventive measures. Therefore, when we consider athletic training in girls sports, our ... consider ... the prevention of injuries. I would like to talk briefly about (1) prevention of injuries, (2) incidence of injuries, and ... training.

Prevention of Injuries

Physical condition of the participant

According to many trainers, medical records, and some coaches, inadequate conditioning is a contributing factor in the high percentage of athletic injuries. The most dangerous period in any sport is the first three or four weeks of the season. Undoubtedly, the incidence of injury

could be drastically reduced if the precompetition period of a sport were longer so that coaches could spend more time on physical conditioning. As women become more involved in competition, they will understand the need for a minimum conditioning period before the beginning of the competitive season.

A well conditioned girl tends to be less susceptible to injury than a poorly conditioned girl. With prompt care, a minor injury will remain a minor injury, however, many will become serious injuries if the girl returns to activity too soon. Muscle imbalance, improper timing because of poor neuromuscular coordination, lack of ligamentous tendinous strength, lack of flexibility, and inadequate muscle bulk are among the causes of injury that can be directly attributable to insufficient or improper physical conditioning.

A regular warmup should be performed before activity begins. It should take longer in cold weather than in warm weather, and should be as thorough on practice days as on game days. A full routine is necessary, starting at the upper parts of the body and progressing to the lower parts.

Proper rehabilitation is vital in the prevention of recurring injury. It is dangerous to allow a girl to resume activity before an injury has healed adequately.

Equipment

Inferior equipment will not provide adequate protection for the athlete. Equipment selection is often influenced by the budget. However, the practice of buying for quantity, rather than for quality, can create more problems than it solves. It is unwise to buy more articles of an inferior quality than a limited number of quality articles that will last longer and give better protection. Inferior items have to be replaced more often (every year), whereas quality merchandise lasts for a longer time. Very often practice equipment is inferior to game equipment, but practices are often harder and deserve the best equipment.

Mechanical difficulties

Mechanical difficulties due to carelessness, such as holes in the turf of a playing field or track dirt on the basketball or volleyball court, are the causes of many injuries. The fields, courts, and other playing areas should be checked regularly, and dangerous conditions should be remedied.

Broken equipment

Broken or torn equipment should not be worn or used. shoes that are ripped or missing a spike are hazardous. Rigid inspection before practice should be stressed by each coach.

Protective taping

Protective taping plays a very important part in the prevention of injury and special pads can protect a previously injured area against further injury.

Incidence of Injuries

A brief survey of sports injuries reveals that contact sports have the highest incidence of injury. Basketball ranks rather high on the list. Most injuries in this sport involve the wrist, elbow, fingers, and/or head, and occur as the result of some kind of collision—either with other players or during an attempt to ward off an impending collision with walls, bleachers, or other equipment. Ankle and knee injuries are most likely to occur during plays under the basket or in changing direction.

Softball has a relatively low incidence of injury. Improper sliding techniques, improper hand postures, and unevenness of playing surface account for the majority of the limb injuries; collisions and blows from either bat or ball are most often responsible for injuries to the head and neck.

Track, which has a tremendous number of participants, also has a relatively low injury rate. Muscle pulls, knee and ankle injuries, puncture wounds resulting from shoe spikes, and abrasions are the most common injuries associated with this sport.

More shoulder, elbow, and wrist injuries are reported in gymnastics and volleyball than most other sports, whereas in tennis, the incidence of ankle, knee, and wrist injuries is sporadic.

A number of factors, either congenital or acquired, may predispose a girl to a specific type of injury. Some anomalies in anatomical structure or in body build may make a girl prone to certain types of injuries.

Problems in Training

Common problems in training are quite varied and depend upon the level of the activity. Some of these problems are:

Atrophy. The most common type of atrophy is caused by disuse. When there is an injury, the immobilization and lack of use result in a wasting away or decrease in the size of the muscle(s). Atrophy appears relatively rapidly, but with proper exercise and treatment, normal strength and muscle tone can be regained. Atrophy as the result of a nerve injury is as common as atrophy from disuse.

Heel bruises. These occur more often in track and basketball than in other sports because in these activities a girl is most apt to land hard on her heel. This is painful and sometimes disabling. When this injury occurs, swelling takes place between the bone and periosteum.

Bone spurs. Bone spurs are projections of bone found on the calcaneous. They become painful when they are large enough to interfere with the proper fitting of shoes. The cause may be trauma, infection, or metabolic disturbance.

Colds and headaches. These are two of the most common conditions seen by trainers. They occur at all times of the year and each sport is well represented.

Wounds. Wounds are perhaps the most frequently seen condition in the training room. They manifest themselves in the form of abrasions, lacerations, puncture wounds, and burns. There is no such thing as a minor wound; all are serious in that the possibility of infection is constant.

Skin conditions. Blisters, calluses, and warts are seen in sports that involve a great deal of friction on the feet.

Sun exposure. Heat stroke and heat exhaustion are generally seen in the spring and summer months when the temperature is high and the body is dehydrated and lacks salt.

Rehabilitation

Generally, women are following the same rehabilitation procedures as the men. Both men and women follow the same pattern—the cycle of injury, attempt to break the pain, then exercise. The major difference is the amount of weight that is used. It must be within the girl's capacity to manage.

The trainer and coach work under the direction of the team physician in matters involving medical practice. Until there are more qualified women trainers, the coach will often serve in a dual capacity—as coach and trainer. Therefore, it is of prime importance to secure knowledge and experience in this area.

Summary

The incidence of injury appears to be slightly higher for women than men. A brief survey of the effect of athletic competition on females indicates that most injuries occur in activities requiring explosive efforts, and that injuries involving conditions of overstrain (bursae or tendinous in nature) occur almost four times as much among women athletes as among men.

Active participation by well trained and coached girls and women has resulted in the usual types of temporary injuries such as sprains, strains, and contusions, which are common to all athletes.

Because of the great increase in the number of girls and women in sports participation, there is a vital need for women coaches who not only have greater coaching knowledge and training in advanced athletic techniques, but who can also take over the training of women and girls for competition. Women trainers should have the same educational and professional background as men. Qualified women trainers and coaches can contribute much to the improvement of women's athletics and can instill confidence and interest in young women who enter the field not only for competition, but also to become trainers and coaches.

Bibliography

Brouha, L. "Physiology of Training Including Age and Sex Differences." Journal of Sports Medicine 2 (1962).

de Vries, H. A. Physiology of Exercise for Physical Education and Athletics. Dubuque, Iowa: William C. Brown Co., Pubs., 1966.

Klafs, Carl and Arnheim, D. Modern Principles of Athletic Training. St. Louis: C. V. Mosby Company, 1969.

Klaus, E. J. The Athletic Status of Women. In International Research in Sport and Physical Education, edited by E. Jokl and E. Simon. Springfield, Ill.: Charles C. Thomas, Pub., 1964.

JOSEPH G. DZENOWAGIS
Michigan State University
East Lansing

PROBLEMS IN WATER SAFETY

Many Americans will meet untimely deaths by water this year. By the hundreds they will swim in unauthorized and unknown waters, step into drop-offs, dive into shallow waters, and overexert and exhaust themselves. Infants will tumble over the edges of home pools. Fishermen will fall from bridges, sightseers from wharves, docks, and piers, sports enthusiasts from boats. Floats will betray the confidence of nonswimmers, boats will turn killer, snowmobiles will spill their riders through ice.

This year over 7,000 Americans will drown. Is there reason to believe otherwise? Let the facts speak for themselves.

The Need for Water Safety Education

The number of drownings has steadily increased since 1950 when 6,[illegible] Americans died by drowning. Last year, 7,[illegible] Americans became statistics on water accident reports, placing drowning in the unenviable position of being the second leading cause of accidental deaths in public places.[1]

Water fun is big business today. With the four-day workweek a reality in many parts of the country, Americans are working less and playing more, and it is the water that attracts them.

The small craft industry is burgeoning. The manufacture of water sports equipment is rapidly expanding. Water facilities are multiplying. Where the 'ole swimmin' hole' has been omitted by nature, man is everywhere committing himself to replace it with indoor and outdoor pools—

[1] Accident Facts (Chicago: National Safety Council, 197[illegible]).

in backyards, hotels, motels, apartments, clubs, schools, and communities.

In short, more people have more time and money today to spend on water play in more readily available facilities than ever before. What are the implications of this escalation in terms of the water safety story?

Cases of Accidental Drowning

The following cases of accidental drownings were taken from the records of the State of Michigan Official Water Accident Report, 1970.[2] Names have been omitted, but otherwise the wording under the section "Describe briefly what happened" (recorded from the testimony of witnesses) remains essentially the same.

Case #1 Victim male, age 10 years. "Victim was swinging on a rope which was fastened to the underside of a river bridge. As he went over the water, his hands slipped and he went into the river."

Case #2 Victim female, age 4 years. "The snowmobile occupied by the owner and the victim's father was towing a sleigh across a lake. The victim and two other children were on it. The snowmobile plunged through the ice and sank in 25 feet of water about 20 feet from shore causing the victim to drown and four other persons to fall into the frigid waters before they were rescued. Using ropes and ladders, officers of the Sheriff's Department were working close to the hole when people rushed out, cracking the ice, stranding two officers who had trouble getting off."

Case # 3 Victim male, age 21 years. "Victim ran into water from beach and dove into shallow water, struck bottom and broke his neck."

Case # 4 Victim female, age 1 year and 11 months. "The victim was put to bed around 7 p.m. Parents of the victim checked her bed at 1 a.m. and found her missing. They notified this office and a search was started. Victim was found at 2 a.m. face down in the canal. Officer's opinion: The family had just bought two ducks for the family. The ducks were kept in a wire cage in the canal in the rear of the home. Apparently the victim got up from her bed sometime during the night and went to play with the ducks. There is a wooden dock on the canal, and the victim apparently fell off the dock and drowned."

---

[2] Interview with Sgt. William H. Carter, Department of State Police, East Lansing, Mich., March 24, 1971.

Case # 5. Victim: male, age 8 years. "Victim and several other children had been playing around the pond or marl pit without supervision and playing hide-and-seek. Victim was missing about 1½ hours before it was reported and a search of the area was made. Victim was recovered in 8 feet of water 20 feet from shore. His mother said he was a good swimmer."

Case # 6. Victim: male, age 3 years. "Mother thought the child was playing in the house and then saw him floating on the surface of the water. He either walked out the sliding door or side door. Officer's comment: With children this small, I feel a small type of alarm indicating the door leading to the pool has been opened, may have prevented this from occurring."

Case # 7. Victim: male, age 33 years. "Victim and companion were fishing in a small craft and both were in a sitting position. The victim went to cast, and as he did, the boat heeled to one side causing him to lose balance, and as he tried to regain balance, the boat capsized throwing both fishermen into the water. The companion hung onto the boat while the victim tried to swim away, and in so doing, went down."

Case # 8. Victim: male, age 12 years. "Victim was wading with his 14-year-old brother in approximately 4 feet of water. Both subjects stepped into a drop-off approximately 12 feet deep, an area which is used for diving from a platform. The brother of the victim stated that when he and his brother went under the water, he grabbed the victim by the arm but lost his grip. He stated further that the victim then grabbed him by the foot and was holding him under the water. He stated that he freed himself and could no longer see or feel his brother. Both subjects were nonswimmers."

Case # 9. Victims: male, age 57, and male, age 58 years. "The four subjects were on a fishing trip on Lake Michigan. About one-half hour after they started fishing, the boat began to take on water from the bottom. Then a wave came over the boat, causing it to sink. All four subjects went into the water. The life preservers were in the water (cushion type) and they all had one." Two men drowned.

While it is not my intent to criticize the efficiency of reporting this accident, I would like to point out that frequently there are contributory or causative factors omitted in a terse report which have value in terms of accident prevention. Let me illustrate with excerpts taken from

newspaper account of the last case, giving a more graphic picture of the accident.[3]

> According to one of the survivors, the party had launched the owner's (victim # 1) big ocean-going, 23-foot cabin cruiser and had just landed the first salmon about four miles off shore when water was noticed in the stern of the boat.
>
> "We asked the owner if the bilge pumps were working," said one of the survivors, "but then I sat on the side of the boat and saw water pouring in."
>
> He said one of the two outboard engines stalled and that the owner was trying to get it going again when the second one stalled. "I bailed with a bucket, but we just couldn't bail fast enough. The water kept gushing in. The next thing we knew the stern was down to a point that the bow was straight up in the air. We all stood on the windshield."
>
> In the water, the two survivors showed victim # 2 "how to put the buoyant cushion around his back and to lie on his back and kick with his feet."
>
> When he was found dead by the Coast Guard four hours later, he was still clinging to the cushion. Victim # 1 was last seen alive clinging to an ice chest.
>
> One of the survivors later related that the owner stressed, "the guy I bought this boat from said it can't sink. Stick with the boat." The boat capsized in Lake Michigan.

Incidence of Water Accidents in Michigan, 1969 and 1970

While the number of water deaths and injuries remains consistently nigh, it should be noted that without the persistent and continuing efforts of the law enforcement agencies, this toll would undoubtedly be much higher.

The provisional water accident statistics for 1970 show encouraging gains in some areas for the year past. Let me present some comparisons between the statistics for 1970, as submitted by all Michigan law enforcement agencies as of January 31, and 1969 for the same time period.[4]

---

[3] Frank Mainville, "State Official Escapes Death," Lansing State Journal (Sept. 10, 1970), p. 2.

[4] Water Accidents in Michigan Annual Report (East Lansing Mich.: Department of State Police, 1970.)

Table 1

Water Accidents in Michigan

Totals	1970	1969
Reports Received	699	683
Fatal Accidents	280	315
Personal Injury Accidents	203	186
Property Damage Accident	216	182
Persons Killed	300	348
Persons Injured	283	269
Breakdown of Deaths		
Boat Operators	39	45
Boat Passengers	39	44
Swimmers/Waders	140	137
Scuba/Skin Divers	1	3
Skiers	1	3
Fell Though Ice	5	19
Fell from Bridge, Dock, Bank, etc.	42	61
Attempt to Rescue	5	5
Snowmobile	1	9
Other	27	22

Of the above 300 persons killed, 14 of these died as a result of a water accident other than drowning.

Research and Accident Data

Since water can be made safe for humans to only a very limited extent, the challenge lies in educating people to use water safely. Effective contributions to water safety can be made through research, dissemination of information, education, and training.

Water accident reporting is one of the most effective devices used to advance this goal. Specific accident data yield the kind of information needed to assess the roles certain factors play in water accidents. From the analysis of this information, patterns emerge that indicate directions in which to develop preventive programs and implement counter-measures to the irresponsible use of water.

The process of searching out and establishing cause and effect relationships is not as yet a widely established

practice in many states. However, a few successful pioneer attempts have been published.[5,6,7,8]

By and large, however, the adequate collecting, collating, and interpreting of data has been neglected. Comprehensive and reliable information on injuries and drownings on an all-states basis is conspicuously lacking.

The Water Safety Program in Michigan

Michigan is one of the few states whose efforts in establishing the relationship between water knowledge and safety-in-water action have been rationalized.

Much of the success of Michigan's water safety program can be attributed to William H. Carter of the Michigan State Police who has provided outstanding leadership to the program for the past years. It is through his efforts in initiating and promoting water safety and accident prevention that Sergeant Carter, otherwise known as Mr. Water Safety, has not only raised the standards of water safety throughout the state and made the citizenry more conscious of it, but has also gained a national reputation for expertise in the field.

Responsibility of Law Enforcement Agencies

Michigan's intensive involvement with the problem began 11 years ago when the Michigan State Police were required by statute to compile water accident statistics. Since then, a valuable body of water safety intelligence has been gathered to reveal the structure of the problem and methods that may be effective in surmounting it.

Data on boating and nonboating accidents is obtained through the cooperation of all law enforcement agencies including the State Police, the Michigan Sheriffs' Association, the Harbormasters Division of the Detroit Police Department, and from all departments directly or indirectly

---

[5]Edward Press et al, "An Interstate Drowning Study," American Journal of Public Health 58 (Dec. 1968), pp. 2275-2289.

[6]Daniel Webster, "Pool Drownings and Their Prevention," Public Health Reports (July 1967), pp. 587-600.

[7]Wayne Cross, "Accidental Drownings in Iowa 1950-1963," Annual Safety Education Review 1965 (Washington, D. C.: American Association for Health, Physical Education, and Recreation, 1965), pp. 38-49.

[8]United States Coast Guard, Boating Statistics-1969 (Washington, D. C.: Department of Transportation, 1969).

involved in marine law enforcement. Nonboating accident information is also obtained with the assistance of the vital statistics section of the Michigan Department of Health, county coroners, medical examiners, and physicians who are requested to report nonboating accidents to public agencies.

This water accident information provides a bank of data for use by organizations and agencies throughout the state concerned with water safety. It is in the form of a booklet entitled "Water Accidents in Michigan" which is prepared and published annually by the Department of State Police. Included in the report are details, analysis, and evaluation of water injury and death occurrences and causes in both boating and nonboating categories.

I would like to present some findings from the 1969 study which reveal, among other things, that the water safety program in Michigan needs more aggressive participation and leadership from within the field of education.

Nonboating Accidents

The following list describes the most common factors involved in nonboating accidents.

1. Most involved young people under the age of 20. They accounted for 155 (60 percent) of the total drownings in nonboating accidents.

2. Most involved were males. They accounted for 85 percent of all drownings.

3. Most (64 percent) fatal nonboating accidents occurred during the months of June, July, and August. Continued warm weather in September accounted for another 10 percent of the total.

4. Most occurred on Saturday and Sunday. A significant number of accidents occurred throughout the week, but no single day showed a great increase or decrease.

5. The most frequent contributory causes of nonboating water accidents were falling in water, physical failure or exhaustion, nonproficient swimming, falling through ice, and swimming in unknown waters.

6. Most of the nonboating drownings occurred between the hours of 11 a.m. and 9 p.m., with the worst period being from 1 p.m. to 4 p.m.

7. Of the total number drowned in nonboating accidents, 51 percent were swimming or wading, 9 percent were playing near the water, and 3 percent were snowmobiling.

8. Most nonboating water fatalities occurred when the following weather conditions were present: light wind, calm water, good visibility, and clear skies.

9. Investigators believe that 21 percent of all fatal nonboating accidents might have been avoided had there been adequate parental supervision.

Boating Accidents

The following list describes [illegible] common factor found in boating accidents.

1. Half of the fatalities occurred on inland lakes. Approximately one-fourth occurred on the Great Lakes, Detroit, and in the St. Claire and St. Mary's Rivers.

2. Most of the fatalities occurred during June, July, and August, with August accounting for the highest total.

3. More vessels (40 percent) were involved in accidents between the hours of 3 p.m. and 7 p.m. than during any other four-hour interval. However, approximately the same percentage of accidents occurred between 11 a.m. and 3 p.m. as between 7 p.m. and 11 p.m.

4. Most vessels (30 percent) were involved in accidents on Saturday, while another 20 percent of the total occurred on Sunday.

5. The most frequent types of boating accidents were collisions with another vessel, capsizing, collisions with an object, falling overboard, and fire or explosion.

6. Two types of accidents, capsizing and falling overboard, accounted for 64 percent of the boating fatalities.

7. The most frequent contributing causes of boating accidents were operator negligence, reckless operation, passenger negligence, unsafe craft, and overloading.

8. Of all the persons killed in boating accidents, 27 percent were under 20 years of age.

Without knowledge of the number of operators by age category, it was not possible to single out any one age group as predominate in the number of boating accidents.

9. The more experienced boat operators had the greatest number of reported accidents, deaths, and injuries.

10. Open motorboats accounted for 51 percent of all fatal accidents, and rowboats and canoes were responsible for 37 percent.

11. Of all fatal accidents, 40 percent occurred to people who were cruising around.

12. Water skiers were a decided problem. They accounted for 12 percent of all reported accidents, 22 percent of the personal injury cases, 5 percent of the property damage cases, and 4 percent of the fatal accidents.

13. Most boating accidents occurred when the following weather conditions were present: light wind, calm water, good visibility, and clear skies. However, 22

[illegible] nt of the fatal acciden[illegible] [illegible] when water [illegible] were rough.

[illegible] People engage[illegible] [illegible] activities acc[illegible] [illegible] percent of those d[illegible] [illegible] boating acciden[illegible]

[illegible] Investigators [illegible] [illegible] percent of t[illegible] [illegible]idents might hav[illegible] [illegible] [illegible]ded if life pre[illegible] [illegible] [illegible]sed or readily [illegible]vailab[illegible]

[illegible] facts emerge [illegible]th [illegible] [illegible] [illegible]arity from [illegible] [illegible] [illegible]ear's (or any [illegible] [illegible]'s) da[illegible] One is that wat[illegible] a[illegible] [illegible]s and injuries [illegible] be pr[illegible]ented. The other [illegible] [illegible]at th[illegible] [illegible] great need for [illegible]ore p[illegible]lic education.

S[illegible] from the Execut[illegible] Offi[illegible]

[illegible] promotion of [illegible]fety [illegible]andard[illegible] and public [illegible] [illegible]tio[illegible] [illegible]fe use of w[illegible]rway[illegible] [illegible]eives strong sup[illegible]t on [illegible] [illegible] [illegible]vel in Mic[illegible]gan. Each year, May is de[illegible]g-nat[illegible] [illegible] [illegible]ter Safety Ed[illegible]ation Month and the governor issue[illegible] [illegible]oclamation urging Michigan [illegible]itizens to partici-pate i[illegible] [illegible] [illegible]spects of water safety education.

I[illegible] [illegible]ast year's proclamation, Governor William G. Millik[illegible]n [illegible]ated

> [illegible] [illegible] year Michigan's waters attract countless thousands of people. Fishermen, boaters, and swimmers make use of our state's 3,000 miles of Great Lakes shoreline, 11,[illegible]00 lakes and 36,000 miles of rivers . . .
>
> However, too often this dimension of pleas-ure is marred by the shadow of tragedy or serious accident. . . .
>
> Because of this, it is obvious that all forces possible should be brought to bear on increasing people's awareness of the vital need for education concerning water safety. . . .
>
> Many volunteer organizations offer swim-ming, boating, and general [illegible]ater safety education programs in . . . virtually al[illegible] communities of Michigan, and similar programs are offered by units of federal, state, and [illegible]cal government in which anyone who is interested may learn the basic skills which will insure their safety.
>
> A concentrated education attack by organi-zations and agencies can bring about an increase awareness of the dangers, and a desire to pre[illegible] these dangers.[9]

[9] Proclamation—Water Safety Education Month (Lansi[illegible] Mich.: Executive Office, State of Michigan, May 19[illegible] [illegible]

The Marine Safety Act

The Department of Natural Resources was directed by the legislature to develop and maintain comprehensive educational programs to advance boating and general water safety and to develop and begin a training program for young people in boating safety.[10] At the same time, to improve the safety of people using Michigan waters, the legislature placed restrictions on boat use by youngsters. Today, any youngster under age 16 may operate a vessel alone providing it is now powered by more than 7 horsepower. He may operate a boat powered by 6 horsepower or more only if he is accompanied by a person 18 years of age or older, or, if he is between the ages of 14 and 16 and has earned a Boating Safety Certificate.

Safe Boating Education

A course called Pleasure Boating was subsequently developed by the Marine Safety Section of the Department of Natural Resources. Leading to a Boating Safety Certificate, the course includes instruction in Michigan watercraft laws and regulations, rules of the road, aids to navigation, safety in small boat handling, general water safety, first aid, weather, required equipment, and selection of balanced equipment.[11]

Upon completion of the required coursework and a successful written examination, the student receives a certificate which permits him to operate a boat without adult supervision. The entire course is without cost to the student. While the program is designed for 12 to 16-year-olds, any boat operator or interested person is urged to participate.

In Michigan, Pleasure Boating is offered throughout the state by different agencies including the U. S. Coast Guard Auxiliary, the United States Power Squadrons, the American Red Cross, and the County Sheriffs' Departments. The last maintain a Marine Safety Program which is concerned with marine law enforcement, search and rescue, water safety education, the recovery of drowned bodies, and inspections of boat liveries. This program is maintained in cooperation with the Marine Safety Section of the Department of Natural Resources and as such, is entitled to receive state aid.

---

[10] Michigan, Lansing, State Capitol, Marine Safety Act 1967, Public Act 303, Sec. 61 and 62.

[11] Pleasure Boating (Lansing, Michigan: Department of Natural Resources, 1967).

Other courses in boating safety offered for both beginning and experienced boatmen by the water safety agencies are:

1. Basic Seamanship, an 8-lesson public education course covering marlinspike seamanship, rules of the road, aids to navigation, piloting, safe motorboat operation, and boating laws offered by the U. S. Coast Guard Auxiliary.

2. Piloting, a 12-lesson course given by local squadrons of the U. S. Power Squadrons, a nationwide organization of boatmen.

3. Basic Outboard Boating, a part of the total water safety program offered by the American Red Cross.

Each of these courses is approved by the Department of Natural Resources and leads to a Boating Safety Certificate.

Since January 1, 1969 when the Marine Safety Act went into effect, more than 92,000 young people have received these certificates. According to the Marine Safety Section, accidents among youthful motorboat operators in Michigan have declined in spite of an increase in boating activity. This growth in boating safety is attributed by the agencies to their combined efforts.

Additional Legislation Proposed

Amendments and additions to Michigan's 1967 Marine Safety Act are under consideration this year. The proposals are intended to strengthen and improve Michigan's Water Safety Program and help solve some of its problems.

One proposal states that the Department of Natural Resources:

> ... shall establish and be responsible for the administration of a general water safety program designed to prevent drownings and other water accidents within this state. A general water safety program shall include, but not be limited to:
>
> (a) General water safety education programs
> (b) Rules of conduct for all nonboating recreational water users
> (c) The developing and recommending of safety standards for public and private bathing facilities
> (d) The promotion of the safe use of waters within this state by all nonboating recreational water users
> (e) The compilation and issuance of nonboating water accident statistics.

Probably because falls from bridges, docks, piers, etc. have consistently been a contributing factor in one-fourth to one-third of nonboating water deaths, the following legislation is also proposed:

It is the declared public policy of this state that when wind conditions on the Great Lakes attain [such] a magnitude that one-third of the waves resulting therefrom cause any public dock, pier, wharf, or retaining wall to be awash, it shall constitute a state not conducive to the orderly and safe use and occupancy of such structures.

Any harbormaster, peace or police officer, or other authorized official may, when such condition exists, rope off or barricade entry to these structures or post in a conspicuous manner notices that entry thereon for the purpose of fishing, swimming or other recreational activity is prohibited.

Since swimming in unknown waters has been a possible contributing factor in approximately 5 to 10 percent of the nonboating water deaths, the following legislation is proposed:

The owner or person in charge of a public or privately-owned bathing beach maintained for public usage shall not knowingly permit a person or persons to bathe or swim from such bathing beach unless buoys have been established in accordance with Section 141 of this act, outlining a safe bathing or swimming area.

No person shall bathe or swim in those waters lying within 100 feet beyond the outer limits of a buoyed bathing or swimming area unless bathing or swimming from a privately owned beach not open to the general public.

Problems of pool safety have prompted the following pertinent legislation:

All swimming pools, public and private, within the state shall be enclosed by a fence which shall be at least four feet in height and which shall be of construction not easily climbed or penetrated by children. If the entire premises of the residence are enclosed, the provision may be waived by the department upon inspection and approval of the resident's enclosure. If the swimming pool is of a portable type with a wall height of at least four feet above the surrounding ground surface and of such construction as not to be easily climbed or penetrated by children, the ends of the fence may be attached to the swimming pool and the fence need be erected only around the immediate area of the ladder and around the access areas to the pool. All gates shall have self-closing latches with the latch on the inside of the gate not easily within reach of children.

As used in the act, a swimming pool is any artificially constructed pool intended to be used for swimming or bathing, and having a depth of two feet in at least one point.[12]

The Involvement of Educators

If the proposed legislation is passed, Michigan will certainly have a stronger Marine Safety Act and undoubtedly achieve the desired result of fewer water deaths and injuries.

Although it may be an effective measure in prodding the citizenry to more conscientious water safety behavior, legislation is not the be-all of a successful program. Success in water safety demands the cooperation of all agencies that hope to achieve improved water safety performance. As one force rich in service potential, the schools should not be ignored.

Michigan's Marine Safety Act could have greater impact if certain responsibilities had been defined for the State Department of Education. In the interest of a total program, Michigan—and every state—should assess the contribution potential of its Department of Education and schools in order to maximize benefits from the safety program.

The character of water safety education compels the use of the teaching expertise and resources of the schools to further the program. Working toward the prevention of water accidents should be a joint endeavor of the schools and groups working outside the schools.

Leadership and Cooperation at the State Level

One of the most effective instruments in a water safety program is an advisory council responsible for general water safety in the state.

Members could be representatives of official and voluntary organizations, professional associations, and individuals working in school and college programs. The involvement of these people and groups would vary according to their areas of expertise.

Some of the basic functions of such a council could be:

1. To offer each participating agency the opportunity to extend its resources through a partnership with other groups providing leadership and services in water safety

[12]Interview with James Marrindale, Marine Safety Consultant, Department of Natural Resources, Lansing, Mich., March 22, 1971.

2. To act in an advisory capacity to the official agency of the state that is legally charged with the major responsibility for water safety

3. To provide an avenue of communication between interested agencies and organizations by serving as a clearing house for the exchange of information on policies, experiences, plans, methods, and procedures related to programs

4. To become acquainted with water safety resources available in the state, and to evaluate their impact on the water accident problem

5. To help coordinate the resources of the official, voluntary, and professional agencies in the state which are designed to promote water safety

6. To encourage and aid in developing demonstrations and/or experimental programs

7. To promote conferences and other types of programs for groups and individuals interested in selected aspects of water safety

8. To aid the schools and communities in the development of comprehensive school-community aquatics programs

9. To aid colleges and universities in their efforts to prepare physical education and recreation personnel with competencies in aquatics.

The Advisory Council in Michigan

Michigan's Marine Safety Act gives the Director of the Department of Natural Resources authority to establish a boating and water safety advisory council of such membership as he may deem appropriate.

Such a council was established about a year ago and includes in its membership representatives of the Michigan United Conservation Clubs, the Michigan Water Ski Association, the United States Coast Guard Auxiliary, the YMCA, the American Power Boat Association, the American Red Cross, the Department of State Police, and the Michigan Marine and Snowmobile Dealers Association.

During this past year, some of the concerns and efforts of the council have focused on:

1. Suggestions for legislative changes and additions

2. Ways to increase the use of the mass media to inform and educate the public in accident prevention

3. The development of "Our Pool Rules" placards designed to promote home pool safety

4. The possibility of having swimming lessons and programs available at state parks

5. Ways to get more adults as well as children to learn to swim

6. The sponsoring of a poster contest on water safety for 12 to 16-year-olds.

7. The improvement of normal safety education programs at the local level.

Although still in its infancy, it is hoped that the council will expand to involve other agencies interested in Michigan's water safety program. These additions could include the State Department of Education, the Department of Public Health, the Michigan Association for Health, Physical Education, and Recreation, the Michigan Recreation Association, and the Michigan PTA.

Education should be called upon to play an increasingly important role in the solution of accident problems in the years ahead.

Leadership and Cooperation at the Local Level

To help reduce and eliminate water accidents, every community or county would benefit from a good aquatics program. The primary purpose of such a program would be to ensure that people of all ages become water safety conscious and learn aquatic skills for survival, fun, exercise, and sport.

The Effective Community Aquatics Program

An effective aquatics program can be achieved in a community when interested groups and individuals cooperate and provide leadership and service in reaching clearly defined, agreed-upon goals.

However, each community differs in both the quantity and quality of available resources. In some communities aquatic facilities, resources, and talent are abundant but may not be used effectively because of a lack of leadership and coordination. Some communities may be making effective use of very limited facilities, while others, for one reason or another, are not making any attempt to develop aquatics programs of any kind.

Aquatics Needs of the Community

Each community needs:

1. To assess what it is doing to meet the aquatics or water safety needs of individuals in that community.

2. To identify available resources, facilities, and talent in the community for possible use in aquatic programs.

3. To assess the degree to which individuals in various age groups possess the knowledge and skill to participate safely in water activities.

4. To develop clearly defined goals for a community aquatics program that would meet the needs of the individuals in the community.

5. To provide some kind of mechanism, such as a community council, to initiate and expand cooperative community action aquatics programs.

Community Aquatics Program

Guidelines for a community aquatics committee and program are readily available.[13, 14, 15] Activities that might be included in a school-community aquatics program are:

1. Water safety courses to develop and train instructors for the American Red Cross
2. Water safety aide courses to develop and train young people in pool safety and swimming instruction
3. Adult swimming courses
4. Synchronized swimming for people of all ages who might be interested in artistic water proficiency
5. Swim-and-slim, swim-and-trim, swim-to-stay-fit programs designed for fitness and physical well-being
6. Recreational swimming for the public
7. Survival training for the public
8. Drownproofing, a system of self-rescue
9. Infant training, or swimming for preschoolers
10. Small craft instruction
11. Scuba training
12. Rescue squad training
13. Underwater rescue training
14. Competitive swimming, interscholastic and AAU training
15. Clinics for pool managers
16. Clinics for competitive swimming and diving.

Problems Facing Schools and Colleges

At present, little information on water accidents is available in school-community programs. While there have been few reported deaths in school aquatics programs,

---

[13] A Guide for Forming a Community Aquatic Committee (Washington, D. C.: American National Red Cross, 1961).

[14] Operation Waterproof Fourth Grade (Chicago: National Safety Council, 1963).

[15] The School, The Swimming Pool and The Community (Harrisburg, Pa.: Pennsylvania State Department of Education, 1970).

accidents and injuries do occur, and the schools should utilize accident investigation and reporting as a preliminary step to preventing future accidents.

To my knowledge, only a few states have an accident reporting system for obtaining information on accidents and injuries occurring in their schools.

I feel that a state-wide system of accident reporting is necessary. By pooling, analyzing, and disseminating such information with suggestions for the prevention of accidents and injuries, schools would become more alert to accident hazards within their programs.

In Michigan, we have 278 school swimming pools, many of which are used by a variety of age groups for different aquatics activities.[16] New pools are being planned and put into use every year.

Special studies of problems related to school pools and programs are needed to provide data on the kinds of improvements and policies needed for high quality school-community aquatics programs.

Questions are being raised by school administrators concerning the qualifications of the personnel involved in aquatics programs in their school districts. What should be the minimum requirements? Do all physical educators and, or school recreation personnel have the necessary competencies to conduct or help conduct such programs? Some school administrators in Michigan have had a difficult time finding competent personnel to develop, organize, and conduct high quality programs. Are the teacher-training institutions that are preparing physical education and recreation people neglecting the area of aquatics education?

The Aquatics Council of AAHPER has been concerned with the need to improve aquatics programs and teaching standards in schools and colleges through more effective preparatory programs, and to develop guidelines and standards for professional aquatics leadership.

Last year, AAHPER sponsored the First National Aquatic Conference on Professional Standards. This conference was concerned with basic aquatics education for the physical educator, the aquatics specialist, and full-time aquatics leader. The proceedings contain important

---

[16] Interview with Edwin G. Rice, Consultant for Health Education, Physical Recreation, and Recreation, State Department of Education, Lansing, Mich., March 23, 1971.

information for those interested in improving the standards of professional preparation of aquatics personnel.[17]

The conference members made an excellent start in defining the competencies and qualifications needed by aquatics personnel to carry out their professional responsibilities.

Summary

There is no one solution to the water accident problem. However, steps could be taken now to significantly reduce certain water safety problems by:

1. Improving water accident reporting systems at the national, state, and local levels
2. Using the findings to establish priorities for preventive action programs and specific counter-measures to certain types of accident problems
3. Improving cooperative relationships among all the agencies and groups working toward water safety on national, state, and local levels
4. Ascertaining levels of water safety knowledge, attitudes, and skills of various age groups
5. Getting state departments of education and schools to recognize the high priority aquatics education should have in the school curriculum, and taking the necessary steps to achieve high quality programs
6. Securing financial, legislative, and enforcement aid commensurate with the magnitude of the problem.

If these goals are achieved in the near future, many needless tragedies will be averted, and many persons will be able to continue to enjoy the benefits of safe participation in aquatics activities.

---

[17] Aquatics Council, Conference on Professional Standards for Aquatic Education (Washington, D. C.: American Association for Health, Physical Education, and Recreation, 1970).

MERRITT H. STILES
Private practice of medicine
Spokane, Washington

INJURY PREVENTION IN SKIING, SNOWMOBILING

Accidental falls are common in skiing, yet injuries are relatively rare, and fatalities almost unknown. The cooperation of the numerous national ski organizations forming the National Ski Study Group has been an important factor in promoting ski safety. Improved equipment, adequate instruction, and good physical condition are important safety factors. Recent studies have shown an incidence of 3.58 injuries per 1,000 man days skiing (mds) in a crowded 35-acre New England area, and an incidence of 2.6 injuries per 1,000 mds in a 12,000-acre Colorado area. The fracture incidence in the New England area was 0.66 per 1,000 mds.

Comparable statistics were not available on snowmobiling, as it is a relatively new and inadequately organized sport. Because newspaper stories indicated an alarming death rate, the National Safety Council (NSC) initiated a reporting service late in the 1968-69 season which showed 39 deaths reported, and estimated a season total of over 50 deaths involving snowmobiles. During the 1969-70 season, 82 deaths were reported to NSC; drowning and collision were the most common causes.

NSC has taken the lead in snowmobile safety programs by promoting legal registration and regulation, and by instituting broad educational programs. Strong local, regional, and national volunteer organizations of snowmobilers are needed to complement the activities of the already-formed commercial groups.

While skiing and snowmobiling are similar in being winter sports dependent on snow cover, they differ widely from the standpoint of accident potential and injury prevention. The terrain—equipment—human relationship is simple in skiing; it essentially involves an individual and a snow covered terrain, somewhat complicated by a pair of slippery

boards. In snowmobiling, the direct relationship between individual and snow is minor, unless he is stranded by an equipment breakdown in the wilderness. The relationship between snowmobile and snow covered terrain is more important, though still less important than the relationship between man and machine. The risks of accident and injury are similar to those which exist whenever a human being—all too often inexperienced, incompetent, careless, or befuddled—exercises control over a powered vehicle.

This paper will consider the accident and injury potentials of skiing and snowmobiling, and then suggest methods and techniques for injury prevention. Inevitably, skiing will be discussed in greater detail, in part because skiing is a relatively mature sport with many organizations interested in its safe development, while snowmobiling is relatively new, without corresponding organizational structure.

Accident and Injury in Skiing

It is important to make a distinction between accident and injury when discussing skiing. There are many circumstances which result in accidental falls—snow conditions, terrain conditions, the skier's maneuvers—almost all the result of the interaction between skier and terrain. Yet only a very small percentage of these accidents result in significant injury (providing of course, injury to one's pride is discounted). Factors contributing to accidents will be reviewed, and the resultant injuries considered.

Skiing is easiest on a smooth gentle slope, although such a slope is not as safe as it might seem. Deep snow, particularly if heavy and wet, will result in repeated falls for any but the most competent skiers. Hard packed snow and New England "boiler plate" or "blue ice" frequently cause falls. A breakable crust over soft snow resulting from wind packing or alternate thawing and freezing, is a frequent cause of severe falls, and most skiers avoid such conditions assiduously. Steep slopes are more difficult to ski; they are often covered with rounded mounds called moguls, a hazard in themselves, but also a help in turning for the experienced skier. When a steep slope becomes hard packed or icy it introduces the risk of a prolonged, and sometimes dangerous, slide to the bottom should the skier fall. In other snow conditions a steep slope may present the risk of avalanching. All of these hazards are greatly increased by fog or flat light which obscure surface details. A large number of skiers, particularly beginners, concentrated in a small area introduces another hazard, collision with other skiers.

More important than snow and terrain, however, is the ability of the skier himself. Skiing is an unnatural, learned technique. Once past the basic instruction phase, many children quickly become competent by mimicking good skiers. Most older persons progress slowly, in part because of a more cautious approach, and days, weeks, and even years of alternate instruction and practice may be required before a difficult slope can be handled without frequent falls. The difficulties are compounded, of course, if the beginning skier is not in good physical condition. In a study of leg fractures in 1967-68 Dr. John O Outwater of the University of Vermont stated that the skier himself was the principle contributing factor in more than 75 percent of the accidents.[1]

What injuries are encountered? The Volunteer National Ski Patrol System has provided help and rescue to injured American skiers for more than 30 years and kept records of accidents going back many years. A few ski areas with particularly dedicated and qualified medical advisors have also kept records.

With such studies as background, the Public Health Service financed a broader study involving 16 representative areas throughout the country. This study was made during the 1967-68 season under the direction of Dr. James G. Garrick. The following is a breakdown of the types of injuries observed.

Type of Injury	Percent of Total
Abrasions	2
Contusions	5
Lacerations	10
Musculo-tendinous	5
Ligamentous	39
Dislocations	3
Fractures	36
	100

It was noted that the incidence of injury was higher in young skiers than in adults, but rose slightly in skiers over the age of 50. Beginning skiers had a higher incidence of injury, but it declined as their ability improved. Female skiers had significiantly more injuries than males.[2]

[1] R. Garis, "Reducing Ski Injuries" (Paper presented at Winter Sports Safety Congress, Chicago, Ill., Oct. 28, 1969.)

[2] James G. Garrick, "The Epidemiology of Ski Injuries" (Paper presented at American College of Sports Medicine, Albuquerque, N. M., May 9, 1970).

Accident and Injury in Snowmobiling

The snowmobile has demonstrated its usefulness in many ways, such as allowing telephone linemen to make otherwise almost impossible winter repairs, feeding snowbound stock, and winter rescue operations where its load carrying potential is of special value. To my knowledge, there have been no significant injuries reported as a result of such use. The snowmobile injury problem arises rather from its alluring but alarming recreational use.[3]

Snowmobiles have been driven by persons of all ages (including small children) with all degrees of experience, and by many with all too little knowledge of the whims and vagaries of self-propelled vehicles.[4] There have been few available injury statistics in this country; other than in newspaper stories, only the fatalities have been reported in response to National Safety Council surveys, and in a few regional studies.[5] Helpful records have been kept in some Canadian provinces.

Available reports present an alarming picture, with tragic deaths in all age groups. For example: the wife of the Quebec Minister of Highways was crushed under a truck; a family of five in Minnesota was drowned on their first run, from breaking through thin ice: and a five-year-old Massachusetts boy was thrown from a snowmobile and died of a fractured skull. The following is a list of snowmobile fatality statistics:

1968-69	Deaths
Reported to National Safety Council	39
Probable U. S. total	50 plus
Quebec Safety League (700 injuries)	24
Ontario Safety League (300 injuries)	39

1969-70	
Reported to National Safety Council (U. S.)	82
Preliminary Canadian report	26

Of 34 snowmobiling fatalities, nine were caused by drowning, eight by collision with other vehicles, six by collision with a fixed object, four by collision with trains, and seven by other causes.

---

[3]Editorial, "The Alluring but Alarming Snowmobile," Family Safety 28 (Winter 1969), pp. 4-7.

[4]Ibid.

[5]J. P. Fleming, "Safety" (Paper presented at International Snowmobile Conference, Albany, N. Y., May 20, 1969).

John Marsh, Safety Coordinator for the Maine Department of Inland Fisheries and Game, has stated: "I put about 200,000 hunters into the woods a year and have only 50 accidents. Last season there were about 20,000 snowmobiles registered and there were more than 300 accidents."[6]

Professor Richard W. McLay of the University of Vermont surveyed 63 snowmobile accidents reported to six northern and central Vermont hospitals during the 1968-69 season.[7] Accident categories and special hazards felt to be contributing factors are listed below:

Accident Categories	Number
Collision with another vehicle or object	9
Struck by snowmobile	4
Thrown during maneuvers	13
Injured in jump	11
Injured by barbed wire or chain	7
Minor injuries	19

Special hazards include: inexperienced operators, damaged equipment, climbing over banks, poor visibility, barbed wire, speed, thin ice, jumps, and alcohol.

Doctors Stanley E. Chism and A. Bradley Soule of the Department of Radiology, the University of Vermont College of Medicine, studied a total of 103 snowmobile injuries including the 63 studied by Professor McLay.[8] Types of injuries and fracture locations are shown below. The high incidence of fractures of the spine, usually the result of jumping, is of particular interest.

Type of Injury	Number
Fractures and dislocations	67
Sprains	14
Lacerations	12
Contusions	8
Foreign body complication	1
Fatality	1

---

[6] J. Olsen, "Bad Show Out in the Cold Snow," Sports Illustrated 32 (Mar. 16, 1970), pp. 28-35.

[7] Richard E. McLay and S. E. Chism, "A Snowmobile Accident Study" (Paper presented at International Snowmobile Conference, Albany, N. Y., May 20-21, 1969).

[8] S. E. Chism and A. B. Soule, "Snowmobile Injuries," JAMA 209 (Sept. 15, 1969), pp. 1672-74.

Fracture Locations	Number
Skull and face	4
Clavicle, scapula, ribs, sternum	4
Arm	11
Spine	15
Pelvis	2
Leg	27

Prevention of Ski Injury

Skiing is a well-established sport, and there have been many efforts over the years to lessen the risk of injury and to provide assistance to accident victims. The National Ski Patrol System has played a leading role. It was only in 1963, however, that the major national ski organizations formed the National Ski Study Group (NSSG), a non-policy-making, non-dues-paying group comprised of the heads of the following member organizations:

National Ski Areas Association,
National Ski Patrol System,
Professional Ski Instructors of America,
Ski Industries of America,
United States Forest Service,
United States Ski Association, and
United States Ski Writers Association.

The study group was dedicated to injury prevention and the overall welfare of skiing, and invited the National Safety Council to name an advisory member. One of the study group's first activities was the formulation and promotion of the following safety rules.

Rules of the Slope
(a skiers courtesy code)

1. All skiers shall ski under control, in such a manner that a skier can avoid other skiers or objects.
2. An overtaking skier shall avoid the skier below him.
3. Skiers approaching each other on opposite traverses shall pass to the right.
4. Skiers shall not stop in a location which will obstruct a trail, not be visible from above, or impede progress of other skiers.
5. A skier entering a trail or slope from a side or intersecting trail shall first check for approaching skiers.
6. A standing skier shall check for approaching downhill skiers before starting.
7. When walking or climbing in a ski area, skis should be worn, and the walker or climber shall keep to the side of the slope.

8. All skiers shall wear straps or other devices to prevent runaway skis.
9. Skiers shall keep off closed trails and posted areas and shall observe all traffic signs and other regulations as prescribed by the ski area.

Federation Internationale de Ski (FIS), the governing body for the sport, has developed a similar code, but with more emphasis on a skier's obligation to help other [illegible] in trou-

The study group encouraged [illegible] Safety Association (NSAA) in its collaboration with [illegible] Standards Association in the development [illegible] codes, now in effect in most states with [illegible] group worked closely with NSAA in establishing an international uniform trail classification and marking system to indicate relative trail difficulties. In recent years two additional members have been added to NSSG, the Ski Specialists Guild and Ski Retailers International. A standing National Committee on Skiing Safety has also been formed.

Individual ski area operators play a major role in promoting safety through slope maintenance—grooming to remove obstacles, packing deep snow, cutting down moguls, and breaking up and dragging runs which have become too hard packed or icy. Since skiing is a learned technique, instruction is a major safety factor. Beginning skiers, particularly in their mature years, require patient and prolonged instruction with periodic brushing up even after they are relatively experienced. Professional Ski Instructors of America (PSIA) has developed standard teaching techniques and student classification methods so that a skier may move from one school to another around the country with minimum adjustment. PSIA's clinics and instructor certification programs also provide an important service.

Warm comfortable clothing that prevents chilling without impairing free movement is important. Modern skis are generally shorter, lighter, more flexible, smoother on the running surface, and consequently easier to handle. Boots are higher and stiffer, providing better edge control, but also introducing the risk of boot-top rather than ankle fractures. The most important equipment item in injury prevention is the binding which fastens the ski to the boot. Modern release bindings, properly adjusted, will usually release the boot from the ski in a high speed fall, particularly on a steep slope. A fall on a gentler slope at a slower speed may not produce the force needed to release the boot if the ski tip becomes buried, and the resultant slow twisting fall may result in injury. Moreover, even the best binding may be of little value

unless it is properly adjusted. Binding release problems have been studied from the engineering standpoint, and helpful devices developed for checking binding adjustment.[9, 10]

[illegible] condition is an important factor in the [illegible] enjoyment of skiing. Preferable [illegible] conditioning on a year-round basis, not just [illegible] season, [illegible] called "mental conditioning" is also important. It includes education in the hazards of various snow and terrain conditions, and in judgement in the selection of ruts and slopes to be skied under prevailing circumstances. Other measures to lessen the risk of ski injury include: slope grooming, slope and lift maintenance, trail and closed area markings, use of dependable equipment (including release bindings), knowledge of binding adjustment methods, adequate instruction and practice, and education in ski rules of the slope.

Prevention of Snowmobile Injury

The National Safety Council has taken the lead in promoting safety in snowmobiling. Besides gathering records to permit the identification of risk factors, it has published safety education data, and recommended regulatory procedures. Also, in cooperation with a leading manufacturer, it has developed and promoted safety booklets listing the following "Don'ts" and "Do's".

Snowmobile Don'ts

1. Don't drive on highway.
2. Don't drive on railroad right-of-way.
3. Don't tailgate.
4. Don't cut across another's right-of-way.
5. Don't go on ice without knowing thickness.
6. Don't jump a snowbank without knowing what is on other side.
7. Don't be a show-off.
8. Don't put hands or feet near track while driving.
9. Don't let children operate snowmobile alone.
10. Don't travel unfrequented areas alone.
11. Don't panic!

---

[9] G. C. Lipe, "Factual Evidence of Errors and Omissions which Produce Release Binding Malfunction" (Paper presented at Northwestern Medical Association, Sun Valley, Idaho, Feb. 10, 1970).

[10] John O. Outwater and C. F. Ettlinger, "An Engineer Looks at Ski Bindings" (Paper presented at Winter Sports Safety Congress, Chicago, Ill., Oct. 28, 1969).

Snowmobile Do's

1. Do obtain operating instructions.
2. Do learn to know your machine.
3. Do keep it in good repair.
4. Do make sure snowmobile is secure when on its trailer.
5. Do come to a full stop before crossing highway.
6. Do put one knee on seat for bumpy terrain or sidehill.
7. Do leave alcohol alone before and when operating snowmobile.
8. Do go more slowly if children are aboard.
9. Do lengthen throttle cable for children's use.
10. Do use towbar if pulling trailer.
11. Do have adequate light for night driving.
12. Do follow marked trails at night.
13. Do travel with extra caution in unknown areas.
14. Do carry emergency supplies on safari.

The scope of these rules indicates the seriousness of the snowmobile problem; it is all too apparent that continued and increasingly intensive educational programs will be needed if snowmobiling injuries and fatalities are to be lessened significantly. Legislation is needed including, where not now in effect, registration and licensing of equipment, licensing of operators with age limitations, restrictions on horsepower for recreational vehicles, headlight standards, taillight requirements, and regulations on highway use.

Coordinated activity by snowmobilers is needed to develop a greater number of strong local and regional organizations. A strong national volunteer organization would be of major benefit to complement the activities of the existing national trade organizations. Cooperation of volunteer and trade organizations with the National Safety Council in educational and regulatory programs, and in such safety programs as trail marking, would materially brighten snowmobiling's future.

Comment

Do efforts to lessen injury actually produce favorable results? The following comparative statistics from 1960 to 1968 at Mt. Tom Ski Area, Holyoke, Massachusetts, as reported by Dr. Robert D. O'Malley, indicate they do.[11]

[11] Robert D. O'Malley, "A Ski Area's Approach to Safety" (Paper presented at Northeastern Medical Association, Vail, Colo., Mar. 2, 1970).

Years	Man Days Skiing	Injuries	Incidence per 1,000 mds	Fractures	Incidence per 1,000 mds
1960-65	438,022	2,126	4.85	324	0.74
1966-67	120,613	489	4.05	83	0.68
1967-68	102,940	368	3.58	68	0.66

Mt. Tom has a special safety program in effect. The personnel at this ski area will check and adjust bindings, without cost, for any skier who wishes to take advantage of the service, and some 25,000 skiers did during this past season.

When asked why he was packing out so many more runs and slopes than in earlier years, Robert Parker, Marketing Manager of Vail, Colorado, Ski Area, stated: "We feel it is an important safety measure: our injury rate is down from 3.72 per 1,000 man days skiing to 2.6." Dr. James Garrick found a decrease of about one-third in the incidence of injury between his preliminary and final studies. It was his opinion that the most important contributing factor, accounting for about half of the improvement, was the improved proficiency of the average skier.[12]

Paul Copello, whose office processes all injury claims under the U. S. Ski Association insurance program (including travel to and from the ski area) has stated: "Actually, the most dangerous part of the skier's day is the drive home. Looking at claims paid over the years it becomes apparent that skiers, tired from a day on the slopes or in the lodge, are apt to get involved in traffic accidents." Mr. Copello adds: "Walking around frozen streets in ski boots is potentially more dangerous than skiing itself. Wear something more appropriate.[13]

There are some encouraging developments in snowmobiling. Professor Richard McLay reported that one snowmobile club in Vermont with about 85 members, had only one major injury (a broken leg) during the winter of 1968-69. This suggests that participating in a club

---

[12]James G. Garrick, "The Epidemiology of Ski Injuries" (Paper presented at American College of Sports Medicine, Albuquerque, N. M., May 9, 1970).

[13]Paul Copello, "How Safe Is Skiing?," Western Ski Time 3 (Dec. 25, 1968), pp. 16-17.

dedicated to courtesy and safety might make snowmobilers less accident prone.[14]

In closing, it might be appropriate to consider briefly injury prevention in relation to environment as well as to people. While ski areas have occasionally had problems with such things as sewage disposal, and while timber cutting for runs and lifts was often done in conspicuous and unattractive straight lines, the terrain areas involved have been relatively small, and the resultant harm limited. Snowmobiles range widely, however, and disturbing observations have been reported. A winter kill of fish in [illegible] Lake, Wisconsin, was traced to a reduction of dissolved oxygen in the water. Heavy snowmobile use has compacted the snow over the ice, making it opaque and restricting the amount of sunlight getting to aquatic plants which need it to live.[15]

Hunting coyotes by snowmobile was so effective in Ontario that the price of a coyote pelt fell from $25.00 to $5.00. But there were unexpected side effects. Mice and other rodents, ordinarily kept under control by coyotes, proliferated and destroyed field crops to a serious extent. Snowmobiles have also been reported as doing serious direct damage to winter wheat when operated in fields with insufficient snow cover.

The damaging effects of the noisy, ubiquitous snowmobile in driving wildlife away from its usual winter haunts, and in destroying the winter quiet on which wildlife depends for self-renewal, can only be guessed at.[16] Nor is the snowmobile the only environment-altering vehicle. Already in production are all-terrain-vehicles of several types. These are capable of traveling on sand and marsh as well as snow, and some even travel over logs. Also in production are the S P D Triscat and the Air Gator, a snow-boat powered by an aircraft-type engine. Of even greater concern are the one-seat, 8-foot Hoverhornet and the 15-foot Hoverhawk, hovercraft whose horrendous roars may make the typical snowmobile whine sound like a gentle zephyr.[17]

---

[14]Richard E. McLay and S. J. Chism, "A Snowmobile Accident Study" (Paper presented at International Snowmobile Conference, Albany, N. Y., May 20-21, 1969).

[15]Editorial, "Snowmobiles a Menace to Fish," *Environmental Action Bulletin* 8 (May 9, 1970), p. 6.

[16]J. Olsen, "Red Snow Out in the Cold Snow," *Sports Illustrated* 32 (Mar. 16, 1970), pp. 28-35.

[17]"Here Comes Another Unnecessary Danger to Wildlife," *Environmental Action Bulletin* 8 (May 30, 1970), p. 1.

J. DUKE ELKOW
Brooklyn College
City University of New York
Brooklyn

SAFETY FOR THE SEVENTIES

On May 1 and 2 of 1970 a conference was held in Washington, D.C. at the National Education Association headquarters on safety in the Seventies. It served as an evaluation and projection conference of the Safety Education Division of the American Association for Health, Physical Education, and Recreation. Participants assessed the past, present, and future of safety within the Safety Education Division and the extent to which this division could provide services to the many divisions of AAHPER and related professional organizations. It was the wish of those who convened the conference to set attainable goals for the Division for the next five years.

Warren Huffman presented a history of the Division. A detailed historical development of the Division appears in annual reports presented in the Annual Safety Education Review 1967-71.

Environmental safety and hazards control were discussed by a guest participant, Richard Mariand, Assistant Commissioner, United States Public Health Service. He indicated that while it is not always possible to prevent accidents it is possible to control the extent of injury. He reminded his audience of the need to apply more scientific methods to the study of accident problems and to introduce possible solutions to accident control. He indicated that safety education holds significant promise but needs to pick up strategies from the scientist to become more effective in achieving better safety concepts among the people. In the discussion that followed the presentation, it was suggested that the Division find newer techniques for investigating accidents and their controllability.

The conferees were very much involved with identifying the probable location of the Division in the new Alliance of agencies proposed for AAHPER. Robert Holland, then chairman of the task force designated to study the restructuring of AAHPER, developed an illustration lecture of feasible arrangements of societies, councils, and associations to bring into better focus the shifting responsibilities of safety specialists within the new structure.

The conferees formed five committees to study the Division's past, present and future activities. Many assessments of past activities were made. Our materials were excellent in the area of publications. Although our materials were widely distributed, we wished more persons could have received them. Our strength seemed to lie in our national activities and not in local areas. It was felt that we needed to recruit more safety professionals to function effectively at all levels of community activity within the areas of AAHPER. The group took pride in having used an interdisciplinary approach which enabled us to secure greater visibility among the subdivisions of AAHPER. Fortunately, representatives from other divisions at this conference supported our posture and made possible the communication of this concept throughout the Association. It was felt that we need to involve more outside agencies in our safety effort and to share with trainers, coaches, teachers, health specialists, and recreation personnel some of the things we know about safety and to learn from them what their needs are. Then we could pool our combined resources for developing more positive recommendations in the future.

The delegates identified and discussed these 15 problem areas:

1. Where does the Safety Education Division fit in the new alliance?
2. What means of effective communication does the Division have at district, state and local organizational levels and with other AAHPER affiliates?
3. How should Sports Safety be distributed?
4. Shall we develop monographs on specific sports safety topics?
5. How may we best promote a college sports safety course?
6. Shall we develop more guidelines for school safety administration?
7. There is a need to develop a new position paper on the Safety Division.

8. There is a need to develop guidelines for assessing school and college safety programs.

9. How should professional preparation needs be met in safety education?

10. How should safety personnel be recruited?

11. Safety in physical education, health, and recreation should be encouraged.

12. There is a need to develop increasingly sophisticated information on sports safety.

13. The Division should use resources of other agencies and conduct joint programs.

14. How can safety be best taught to children?

15. Safety projects need to be developed for the future.

The conferees felt that the Safety Education Division should place special emphasis on conducting a National Sports Safety Conference in 1972, a Safety Research Conference in 1973 or 1974, and another Evaluation and Projection Conference in 1975 in which more sophisticated measurement devices may be used to assess our attainments than are currently available.

NORMAN J. JOHNSON
Lincoln University
Jefferson City, Missouri

ACCOMPLISHMENTS OF THE DIVISION, 1970-71

Constantly keeping in mind its primary function of service to the profession, the Safety Education Division set down a number of priorities to be accomplished over a five-year period.

Priorities

A. Communications. It was felt that service could best be rendered to district, state, and local groups interested in safety education. Means to reach them as well as other agencies were planned.

B. Leadership Development. Professional preparation and recruitment of safety personnel were the dominant points planned to enhance safety programs in the schools and improve the sources of professional personnel. A. E. Florio took the lead in this area.

C. Structure Reorganization. Immediately after being mandated by the board of directors to develop plans for the division's role under the new alliance, a committee was formed. The plans are now in their final stages. Robert L. Holland, the original chairman of the Association's Reorganization Committee, was assigned the chairmanship. Outstanding contributions were also made by C. Everett Marcum and Kenneth S. Clarke.

D. Research. Plagued with many problems, the Research Committee was reconstituted under Kenneth S. Clarke, chairman, C. Everett Marcum, and Marlene Bieber. The committee outlined its immediate and long range functions.

E. Administration-Evaluation. A need for school safety administration guidelines, college level courses in safety education, and evaluation guides for assessing school and college programs was determined by the council

Convention Planning

Joseph Dzenowagis, vice-president elect of the Division, and committee members J. Duke Elkow, Helen K. Hartwig, Kenneth S. Clarke, Gelinda Vescolani, and C. Everett Marcum planned an outstanding program for the Detroit convention. The committee followed the practice of the previous year by sharing programs of mutual interest with other divisions of the Association.

Committees

Other committees included:

1. The Committee to Revise the Operating Code. This committee is to review the operating code for possible revision and examine the tenure of elected officers, specifically, that of the vice-president of the Division. Its membership included: William G. Helms, chairman, Robert Holland; Gelinda E. Vescolani; and Dewey F. Langston.

2. The Committee on Position Papers. This committee included Joseph Dzenowagis, chairman, Robert L. Holland; and Norman J. Johnson. The committee was implemented with the assistance of Kenneth S. Clarke, Marlene Bieber, and C. Everett Marcum. An interim report titled "Proposed Status of the Safety Education Division In An Alliance of Agencies Which Constitute AAHPER," was submitted to the Associatio This report was incomplete, but represented the status the committee's efforts at that time.

3. Representational Committees. The Structure and Function Committee of AAHPER expressed concern over the number of representational ties the Association has. Each Division was requested to list those organizations and their representatives. After full deliberation, the Safety Education Division decided on the following:

Organization	Representative
National Safety Council, Public Safety Education	A. E. Florio (Bernard I. Loft, alternate)
National Safety Council, Elementary School Section	Unfilled at present
American Medical Association, Medical Aspects of Sports	To be designated

Publications

The division received funds to bring together the editors of the coming textbook, Sports Safety, for a "final fling" in the preparation of the work for publication and to implement plans for another national conference in 1971-72. The editorial committee of the textbook project was asked to study the possibilities of a publication on the elementary education level and report back to the Division Executive Council.

Norman Johnson was asked to write Charles Peter Yost, editor of Teaching Safety in the Elementary School, regarding the revision of this text.

Division Historian

Without written guidelines in the Division's operating code, Warren Huffman, our current historian, prepared a report containing the priority functions of the historian and presented it to the Division's Executive Council. His report was enthusiastically approved. He was also made the Division's representative to the 1985 AAHPER Centennial Committee.

Appreciation

In spite of the illness of key persons such as Gelinda Vescolani, C. Peter Yost, J. Duke Elkow, and Helen Hartwig, the Council members gave the best of their talent. Special thanks also go to our consultant, John H. Cooper, for his determination to secure the attainable goals of the Division

OTHER AAHPER SAFETY EDUCATION PUBLICATIONS

ANNUAL SAFETY EDUCATION REVIEWS
Collected papers covering important aspects of safety education as related to health education, physical education, and recreation. Include papers presented in the Safety Education Division meetings at the AAHPER National Conventions:

1970 Review 96 pp. (244-26128) $2.25
1969 Review 96 pp. (244-26020) $1.50
1968 Review 100 pp. (244-07980) $1.00
1967 Review 72 pp. (244-07830) $1.00
1966 Review 80 pp. (244-07762) $1.00
1965 Review 88 pp. (244-07694) $1.00

SCHOOL SAFETY POLICIES WITH EMPHASIS ON PHYSICAL EDUCATION, ATHLETICS, AND RECREATION
An up-to-date set of recommended practices and policies for school programs of physical activity. 1968 32pp. (244-07948) $1.00

SPORTS SAFETY
The why and how of sound injury prevention and accident control programs, with 56 chapters written by national authorities in their fields. Indispensable information on safety in specific sports and activities, as well as administrative and supervisory concerns common to all areas. Designed as both a textbook and resource guide for all whose responsibilities are related to safety in sports and activity programs. Edited by Charles Peter Y[illegible] and published in cooperation with the U.S. Public Health Service. 1[illegible]
336 pp. Clothbound (244-26134) $7.50;
Paperback (244-26130) $6.00.

TOTAL FITNESS AND PREVENTION OF ACCIDENTS*
How physical, social, emotional, and mental fitness act to prevent accidents. Reprinted from the JOHPER. 1967. 6pp. (244-07828) 15¢

Discount on quantity orders: 2-9 copies of a single title, 10%; 10 or more copies, 20%. No discount on items with * following title. PRICES SUBJECT TO CHANGE.

Order from AAHPER Publications-Sales, 1201 Sixteenth Street, N.W., Washington, D.C. 20036. Orders amounting to $2 or more which are submitted on official purchase order forms may be billed (shipping and handling charges will be added). All other orders must be accompanied by payment. Make check or money order payable to AAHPER.

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION,
AND RECREATION

A National Affiliate of the National Education Association
1201 Sixteenth Street, N.W., Washington, D.C. 20036