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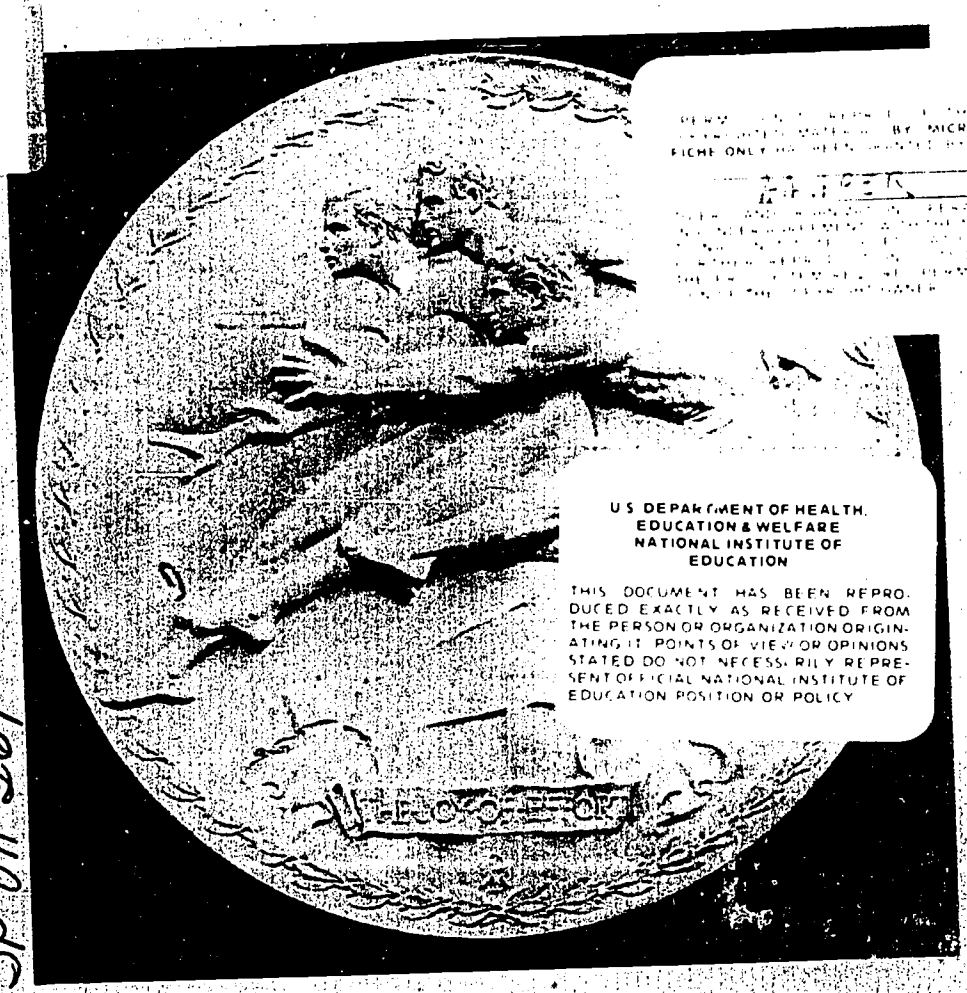
ABSTRACT

Examined in this monograph are issues concerned with accident problems in sports. Materials are organized under eight headings, each developed by an expert in the area: (1) the injury problem in sports; (2) philosophy of sports accident prevention and injury control; (3) an introduction to administration and supervision; (4) administration and supervision--institutional controls; (5) the health examination; (6) leadership controls; (7) facilities, equipment and supplies; and (8) the significance of first aid and emergency procedures. (MJB)

ADMINISTRATION AND SUPERVISION FOR SAFETY IN SPORTS



Sports Safety Series **Monograph #1**

ADMINISTRATION AND SUPERVISION FOR SAFETY IN SPORTS

Monograph #1
Sports Safety Series

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FOREWORD

In 1970 the Safety Education Division of the American Association for Health, Physical Education and Recreation (AAHPER) published the textbook, *Sports Safety*. This publication was designed to provide a comprehensive guide for individuals concerned with injury prevention and hazard control in all areas of sports and recreation. Its use in pre-professional, professional and in-service training programs, by volunteer leaders associated with youth and adult sports programs, by school administrators, physical education teachers, and coaches and by participants met an essential need for a text design to help reduce accidents and injuries in sports.

During the past six years a number of significant changes have occurred in sports and recreation that have affected various aspects of safety. These changes include such things as the increased participation of girls and women in school sports, a result of the Title IX legislation, growing attention to equipment and facility standards, the expansion of intramural and recreation sports programs, the increased popularity of most activities including some newer activities, such as: skate-boarding, snowmobiling, weight training, etc.; improved data collection systems such as NAIRS and NEISS and the increased litigation in sports especially dealing with product-related accidents.

These developments have prompted the American School and Community Safety Association (formerly the Safety Education Division) of AAHPER to proceed with this revision of the original sports safety text. The format for the revised text has been changed. Instead of including all contributions in a single publication, they are being published in a series of six monographs which will comprise a new sport safety series. To accommodate those individuals who desire to purchase all six monographs, a limited number of all of the monographs will be bound into a single volume. This first monograph titled, *Administration and Supervision for Safety in Sports*, is concerned with the accident problem, philosophy of accident prevention and injury control, sport safety policies, instructional controls, leadership controls, equipment and facilities, the health examination and first-aid and emergency procedures. Monograph #2 will deal with the design, function, and operation of data collection systems for sports injuries. Monograph #3 will deal with team sport safety. Monograph #4 will cover safety in individual and dual sports. Monograph #5 will be concerned with safety in aquatic sports and Monograph #6 with outdoor recreational sports safety.

Many people have assisted in the preparation of these revised sports safety monographs. Among those who have been actively involved were Joseph Borozne of Boston University and Chauncey A. Morehouse of The Pennsylvania State University who spearheaded the background work of the revision committee. The ASCSA is deeply indebted to all authors who are identified in the list of contributors. Authors, who made contributions to the original textbook were initially contacted and asked to participate in this revision, and many kindly consented to do so. When individuals were unable to provide a revised manuscript, alternate persons were requested to re-write designated subject areas. Unfortunately, this process was time-consuming, and therefore, influenced the original publication date of this first monograph.

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Chapter 1

THE INJURY PROBLEM IN SPORTS

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Modern technology and scientific understanding of human tolerances have enabled man to walk on the moon. In space vehicles, both equipment and the possibility of human failure are controlled through advanced systems safety techniques. On earth, however, where work and play are normal activities for most people, there is less control of hazards. Daily activities that supplement work, such as play and recreation, satisfy deep-seated psychological demands. In work and play unexpected accidents occur repeatedly unless appropriate controls are exerciesd. If man is to achieve success in work and in play and experience great adventures in life he must learn to curb accidents and injuries that prevent him from reaching his goals. He must learn to identify risks that are reasonable and unreasonable.

Many persons who engage in physical activities do so neither well nor wisely. To enjoy physical activities one has to be free from injury and illness. Yet disabilities in sports stem primarily from accidental causes. The athlete who spends months or years in strenuous conditioning programs may lose in a matter of seconds the results of that effort through a sports injury. An injury to a key member of a team may destroy a chance for victory. Hazards to players must be controlled if man is to achieve greater success in sports.

In recent years the enormous growth of readily available sports equipment and facilities and the increased number of participants have far outstripped the controls designed to make play safe yet enjoyable and health promoting. The resultant injuries often handicap youth and adults. When these injuries are measured in days and years of lost time and loss of human productivity it is evident that sports accidents are a major safety problem.

Until recently, most reports on recreational sports lacked reliable injury data. Since most participation in these activities has been on an individual and unorganized basis, there generally has been no central reporting of accidents. Even in controlled situations such as organized athletics and physical education activities, completion and analysis of accident and medical reports have been resisted by both participants and sports leaders. The scarcity of information on the extent and circumstances of injuries in athletics accounts for the frequent citing of outdated studies.

Although still in the early stages of development, an increasing number of youth organizations is routinely reporting accidental injuries. It is significant that the practice of analyzing such reports often contributes to the taking of injury prevention measures. For example, the annual report of the Committee on Injuries and Fatalities of the American Football Coaches Association has led to the increased efforts to provide better protective headgear and other equipment.

Facts on accidents and injuries in the use of firearms, snow skiing, boating, scuba diving, and baseball prepared by organizations such as the National Rifle Association, National Ski Patrol System, United States Coast Guard, Underwater Society of America, and Little League help to control the hazards of these sports. Studies conducted by the American Red Cross on the circumstances surrounding drownings and near drownings have provided information on factors which contribute to water injuries and fatalities.

Major breakthroughs in the scientific analysis and interpretation of the causes of sports injuries are anticipated as the result of studies by individual physicians and teams composed of physicians, trainers, coaches, and athletic directors. Much of this valuable medical research has been conducted by the American Medical Association's Committee on the Medical Aspects of Sports and similar groups involved in accident studies. The Committee published *Standard Nomenclature of Athletic Injuries* (6) which, if used effectively, will allow for the maintenance of meaningful records and statistics concerning sports injuries, their causes, and their prevention.

The public has become increasingly alert to sports injury problems and has made demands on their legislative representatives. Legislative concern for athletic safety was expressed by Congress through the "Forsythe Amendment" to HR 69 (Section 826 or PL 93-380) which called for a study of athletic injuries in schools and colleges during the 1974-1975 school year. The first report of that study became available in January, 1977.

In recent years the National Electronic Injury Surveillance System (NEISS) of the Consumer Product Safety Commission (CPSC) was established to maintain data on consumer products associated with injuries treated in a representative sample of hospital emergency rooms across the nation. An index highlights the products which are associated with higher frequency and greater severity of injuries. Of major significance to sports personnel are the products that are listed under the description "Sports and Recreational Equipment." In recent years, activities such as bicycling, baseball and football have provided the greatest number of cases of reported injuries in the sports category (See Monograph #2, *Sports Safety Series* for a more complete description of NEISS).

Recently, the National Athletic Injury/Illness Reporting System (NAIRS) was launched to collect meaningful information continuously on a national basis in a uniform manner. As a non-profit activity, NAIRS makes it possible for sports decision makers to receive an extensive amount of information for a small fee (about $50 yearly). Sports directors utilizing NAIRS reports will have information to assist them in controlling sports hazards and improving their programs. (NAIRS is described in more detail in Monograph #2 of this *Sports Safety Series*.)

Accidents and Injuries Defined

Accident. The problem of accidental injury control is complicated by the many definitions of *accident*. Most individuals accept the dictionary definition of accident, *i.e.*, an event that takes place without one's foresight or expectation especially one of an afflictive or unfortunate character. In the sports safety field an accident is an unplanned event capable of resulting in loss of time, property damage, injury, disablement, or even death. Other definitions state that accidents are the occurrence of unexpected physical or chemical damage to living or nonliving structures or that an accident is a chain of events and circumstances leading to unintended injury. To complicate matters further, the term accident is defined by every agency that accumulates such data for measurement purposes. For example, the United States Coast Guard regards a reportable accident as one in which a person has lost his life or has been incapacitated for at least 72 hours by injuries and/or the craft has sustained property damage in excess of $100.

From a behavioral scientists's approach, accidents may be regarded as injury producing behavior with the major characteristics being the degree of expectedness, of avoidability, and of intention. There is concern over such corollaries as degree of warning, misjudgment,

negligence, or duration of the accident. Some researchers question whether injuries or damages should be included in a definition of accident since a resulting injury is the outcome of an unexpected event and does not in itself constitute the accident. Why an individual is injured is a separate question from why he was involved in an accident.

The extent to which society views an event as serious and unexpected determines whether it will call that event an accident. What one group calls an accident may not be regarded as such by another group. Sports fans may refer to an event as an accident while a player or coach may consider it an injury. Identifying an event as an accident is predicated upon the causal factors in that setting, the possibilities of prevention of control, and the seriousness of the harm. (*Accident Facts* published by the National Safety Council uses deaths and injuries as indices in recording accident information.)

Injury. An injury is a damage or hurt done or suffered — a detriment to or violation of person, character, feelings, rights, property, interests, or value of a thing. Two types of injuries are especially used in the safety field — restricted activity injuries and bed disabling injuries.

The National Health Survey conducted by the United States Public Health Service reports that 50 million people are injured each year. Half of these injuries require only brief medical attention and there is no restriction of the person's usual activity. One injury in five confines a person to bed. According to the National Health Survey, *a bed disabling injury* is one which confines a person to bed for more than half of the daylight hours on the day of the accident or on a following day. The National Safety Council defines a disabling injury as an injury which prevents a person from performing his usual activities for a full day beyond the day of the accident. The Council reports that nearly 11 million disabling injuries occur annually. A *restricted activity injury* is one which causes a person to limit his usual activities for a whole day (15). The National Athletic Injury/Illness Reporting System's key definition relates to the disabling character of any injury as follows: *Any injury/illness that keeps the athlete from participation in the performance day (practice or game) following the day of onset is reportable.*

In the near future it seems likely that sports injuries will be more accurately defined as to the quantitative and qualitative limits of damage to person and/or property. From time to time researchers may want to conduct, over a limited span of time, studies of all accidents and near-accidents within a sports activity to determine where a system may be breaking down and then attempt to initiate controls which would benefit coaches and players.

The public is currently demanding improved product reliability to increase safety in the air, in automobiles, and at work. If the public should make similar demands for greater safety in sports, professionals in the sports safety field must be prepared.

Inherent Risks of Activities

In the simplest acts of daily life a certain amount of risk exists, but many of the chances people take are absolutely unnecessary. In the developing science of safety, referred to variously as "hazards control", "injury control", and "accident prevention", it becomes important to identify risks that man faces which are caused by the kinds of activities in which he may engage. When risks have been identified, methods need to be developed and evaluated which enable controls to be established on individual behavior and the environment in the presence of danger. Not all men assess danger similarly. Even when a hazard exists some will avoid it; some will deliberately risk it; and some will avoid it on one occasion and risk it on another occasion.

In sports, participants seek exciting, vigorous, challenging, and emotionally satisfying activities. The fun of sport and the joy of the game are factors sought eagerly by players. To them the question of risk is of secondary importance.

Many athletes minimize the probability of danger. They accept the demands of vigorous contact sports and expect a number of hard blows in achieving optimal physical performance.

Some seek the fun of sports even though they are physically and emotionally unprepared for it. To do so increases the likelihood of injury.

Activities. Athletic activities are generally categorized as contact or noncontact sports. Other terms which are used are team sports, dual or individual sports, and combative or noncombative sports. Injuries sustained in contact sports are generally considered to be the result of stress, competition, and collisions that are an expected part of the game and not of accidental origin. In combative or dual and individual sports the player who is injured may contend an accident caused his impairment or he may admit that he exceeded his performance capabilities.

When the hazards of an activity are known, coped with, reduced in intensity, or eliminated, the probability of injury is curtailed. Therefore players must understand the nature of hazard controls. This responsibility rests fully on sports administrators. Whereas the neophyte needs effective instruction to develop an awareness of potential hazards, experienced players need continued excellent coaching, strong drives for maintaining and increasing skilled performance, and a community that does not make unreasonable demands of its athletes.

It is apparent that risks are exceedingly hard to quantify. Data to assess risks are almost totally lacking. A basic philosophy of safety in sports has not as yet spread in our society. With a wider acceptance of sports safety concepts, information will become increasingly available on risks in sports.

Risks. An athlete runs a 50-50 chance of receiving an injury (18:228). About 90% of all sports related injuries are contusions and minor muscle pulls. The majority of these injuries may not be of accidental origin but an inherent part of the sport. The remaining 10% are more serious. They require appropriate therapeutic measures and should be assessed as to their accidental or non-accidental nature and measures for prevention or control must be initiated when feasible.

About 20% of the one million youngsters who play football sustain an injury to knee, shoulder, or ankle each year (17:68). Fifty thousand non-professional players require surgery on the knee. There are also frequent microtraumatic lesions that become apparent in later life and cause arthritic type impairments. About 25 to 30 persons die of football related impairments annually. This fatality rate affects one out of every 25,000 varsity players, or one per three million man hours of exposure. What does society trade off for these injuries and deaths?

Of course, hazards exist in activities other than sports. It is estimated that 10 times the number of persons die of automotive accidents for an equal period of exposure as those who succumb to football injuries. Home accidents to youth take more lives than sports activities for similar exposure periods. Drug abuse registers a very high rate of impairments and deaths.

One of the few studies on risks in sports was completed by Kenneth S. Clarke and is entitled "Calculated Risks of Sports Fatalities" (8). In it, comparisons are made of the hazards of football, power boating, auto and horse racing, and activities included in daily living. Football has the lowest death rate of all the activities investigated. Clarke contends, "What constitutes undue risk from participation in sports remains intuitive" and " . . . the more a sound research design is incorporated into a sports program, the more the undue-risk question can be put on an individual basis". An assessment of risks must include not only fatality and injury rates but also reports on pathological studies of individuals who have evidence of microtraumatic lesions from sports participation that become apparent and debilitating in later life.

Certain risks taken by players become evident only after careful medical study of the adverse results of sports activity. A boxer who had demonstrated superior ability, nonetheless died from the first blow to strike his head. A basketball player who bumped his head against the chest of an opponent also died because he, too, had a very thin skull. These are examples of anomalies that are determined after injury and can seldom be detected prior to participation in a vigorous sport. What is needed is to determine which recurrent conditions can be detected prior to serious injury and to exercise appropriate measures to protect athletes from harm.

The dangers of swimming are well known. About 8,000 persons drown each year. Many are

saved from drowning through effective community safety programs. The risks of drowning are greatest to young males who are overconfident of their swimming ability and stamina. In a five-state study over a 12-month period 1,201 people drowned; of these, 85% were males. Significantly, the water was very cold in one-third of the drownings where the water temperature was known. Of the fatalities in which the victims's swimming ability was known nearly one-half were classed as good or average swimmers. Of the total, 293 drowned while swimming, 132 while playing in the water, 105 while power boating, and 79 while fishing (12). Water sports are the most dangerous to persons insured by the Metropolitan Life Insurance Company, with boating and fishing ranking next.

As data accumulate on how and why persons drown, newer controls will be introduced. One in 27,000 persons drown annually in the United States. It is noted that over a million swimming pools are now in use. Most are home swimming pools where limited control is exercised. An enormous increase is anticipated in the construction of indoor and outdoor home pools in the near future and an increase in drownings is expected unless man learns to cope with the hazards such pools introduce. To curb deaths and injuries in aquatic sports requires many environmental and human controls which reflect a full understanding of the dangers.

National Data and Public Involvement in Accidents

Recreation and sports provide the American people with increasing opportunities for adventure, excitement, status, and enjoyment. Over 90% of Americans engage in at least one or more of the 90 outdoor athletic and recreational sports activities now available to them. The current participation explosion in recreational sports is unprecedented. The mushrooming population has more time and money to spend in the rapidly expanding world of sports and recreation.

In 1800, the work week was 84 hours. In 1910, it was 52 hours, in 1960, 40 hours, in the 1970's it was 36 hours and in 1980's it may well reach 32 hours or less, with a four-day work week. In the next 25 years Americans may have a total of 700 billion more hours of leisure time than they had a quarter of a century ago. It is expected that they will find participation in innumerable sports interesting and will invent new and challenging activities to fill their leisure hours.

We are an active nation. Of the 215 million persons in the United States over 120 million swim annually, 100 million bicycle. Sixty million persons go boating, some 45 million fish casually while 26 million fish seriously, approximately 50 million use firearms and 23 million hunt annually. About 46 million persons camp each year, 35 million bowl, 5 million ski, 16 million water ski, over 3 million go fishing through the ice in 13 states and about 2.5 million go snowmobiling.

It is estimated that over 45 billion dollars are spent annually on recreational sports. This sum exceeds the cost of all accidents which in one recent year was 43 billion dollars. Public accidents, which include most sports-related mishaps, alone cost Americans 4.4 billion dollars annually. It is difficult to estimate how costly sports accidents are to our people in terms of injuries as well as damage to equipment.

An interesting study by LaCava (11) records the frequency of sports injuries to four million Italian athletes during an eight-year period. The accident frequency of the 17 sports studied are listed in descending order: rugby, wrestling, weightlifting, football (European style), boxing, cycling, roller skating, baseball, riding, gymnastics, swimming and water polo, skiing, basketball, fencing, volleyball, rowing, and tennis.

Although millions of people engage in sports annually, only a few athletes are injured fatally. In New York City, 104 persons died of sports injuries during a 32-year period, that is, an average of slightly more than three deaths annually (7:69). Few sports page readers realize that a sports death may be caused by factors that are distantly related to athletic performance.

Nearly 20% of all deaths in athletics were caused by heatstroke as shown in one limited study (7:69). A significant number of deaths are known to be caused by hypothermia (subnormal body temperature) induced by environmental factors.

The following national agencies, to name a few, are active in collecting sports injury data: American Camping Association, Little League Baseball, Inc., National Ski Patrol System, National Federation of State High School Associations, the National Athletic Injury/Illness Reporting System at The Pennsylvania State University, the National Collegiate Athletic Association, and the National Football League. The National Safety Council, in *Accident Facts*, reports school sports accidents annually within their listing of school and nonschool jurisdictional accidents.

For many years the Safety Education Division of the American Association for Health, Physical Education and Recreation recommended that a national clearing house on sports injury information, sports accidents, and sports research be created to gather information not effectively assmbled by other agencies. Realization of that goal is at hand.

Recently, the American School and Community Safety Association of the American Alliance for Health, Physical Education and Recreation has emerged from the aforementioned Division. It has conducted national conferences on sports safety, publishes a quarterly, *Safety Forum*, and has provided needed leadership in the dissemination of new safety concepts including those dealing with sports safety.

School and College Accidents and Injuries

Information on the number of participants in secondary school sports is available from the Sports Participation Survey of the National Federation of State High School Associations (see Table 1). Some ratios of injuries and accidents to the total number of participants have been developing in various sports. Current studies listed sports as having a high, middle, or low hazard rate. With improved research designs, future researchers will be able to identify more clearly than is possible now which sports have a high incidence of danger and which do not. Even within a sport it will be possible to determine which activity is more hazardous than others, such as an offensive or defensive position in football, and how the hazard may relate to equipment used or not used.

Sports related accidents in the secondary schools of New York State which were studied by Pechar (16) fell into two categories: *personal factors* (i.e., physical and mental-emotional factors) and *administrative factors*. Pechar states that 62% of the accidents were caused by personal factors and 38% by administrative factors. Physical factors included fatigue and muscular weakness. Mental-emotional factors causing accidents were in ranked order: disregarding instructions, taking unnecessary chances, and acting before thinking.

In the 96 schools selected for this study, 1,408 accidents occurred to students during a one-year period. The ranked order of sports accidents in the study are given in Table 2. Most of the accidents occurred in October and September; the fewest happened in June. Most occurred on the athletic field with the gymnasium ranking second. Sprains were the most frequent injury with the leg and foot most often impaired.

A study of accidents in 207 public junior high schools by Dissinger (9) reveals that three-fifths of the 1,026 accidents occurred in physical education or closely related activities. Boys were involved in accidents in basketball, football, softball, and baseball. Girls met with accidents primarily in basketball, volleyball, and stunts and tumbling. Accidents in the physical education classroom had a lower severity index than those in interscholastic practice, interschool games, and intramurals. The most severe injuries occurred in wrestling, football, and track. Immediate causes of injury were falling and striking or being struck by play equipment or another player.

Junior high school football produced one injury for every 10 participants in one season at a school in Ft. Lauderdale, Florida. Among the 1,194 players, the following injuries were

recorded: bruises, 38%; sprains, 33%; fractures, 13%; abrasions and lacerations each 7%; and dislocations, 2%. Two-thirds of the injuries were sustained at practice, the rest during games (14).

Table 1
1969 Sports Participation Survey

	Number of Schools	Number of Participants
Badminton	965	11,609
Baseball	13,002	360,157
Basketball	20,227	676,559
Bowling	591	8,974
Cross-Country	7,818	144,488
Curling	711	5,314
Decathlon	48	102
Fencing	42	666
Field Hockey	103	1,850
Football — 11 Man	13,959	853,537
8 Man	657	14,593
6 Man	110	1,950
9 Man	113	2,749
12 man	768	29,601
Golf	8,650	93,841
Gymnastics	1,842	34,172
Ice Hockey	681	17,650
Lacrosse	123	2,736
Pentathlon	43	250
Riflery	305	4,279
Rowing	24	403
Rugby	22	465
Rugger	16	263
Skiing	461	8,430
Soccer	2,217	49,593
Softball	164	3,300
Swimming	3,229	83,286
Tennis	6,221	83,717
Track and Field (Indoor)	1,918	42,998
Track and Field (Outdoor)	16,836	623,139
Volleyball	3,519	63,144
Waterpolo	152	5,854
Wrestling	6,870	226,681

Source: National Federation of State High School Athletic Associations, 1969.

College Accidents. A study conducted by the American College Health Association (14) on 22 college and university campuses showed that 207,000 full-time students reported 14,487 injuries of which 1,247 were disabling. Victims of nearly three-fourths of the injuries were males, although they comprised less than two-thirds of the enrollment. One out of eight males and one out of 12 females were injured. Eight percent of the injuries were disabling beyond the day of the accident. Distribution of on-campus accidents was: 52% in athletics and recreation,

Table 2
Rank Order of Sports Accidents

Activity	Number of accidents	Incidence per 1,000 exposure	Days lost: gross	Severity: days lost per 1,000
Football	1	2	1	2
Basketball	2	7.5	2	7
Wrestling	3	5	5	6
Soccer	4	6	4	5
Track and field	5	10	7	11
Heavy apparatus	6	14	3	9
Baseball	7	7.5	8	10
Touch-flag football	8	9	6	8
Lacrosse	9	4	10	4
Softball	10	12.5	12	14
Volleyball	11	11	11	13
Games and relays	12	18	9	17
Tumbling	13	16	13	15
Swimming and diving	14.5	15	16	16
Ice hockey	14.5	3	15	3
Six-man football	18	1	14	1
Badminton	22	12.5	18	12
Tennis	22	17	19	18
Calisthenics	22	19	17	19

Source: Pechar study cited in H. J. Stack and J. Duke Elkow, *Education for Safe Living*, 4th ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966), p. 111.

Table 3
Ranks of Sports Injuries at Harvard University

Rank	Injury	Totals
1.	Sprain	1,612
2.	Muscle contusion	1,016
3.	Strain	885
4.	Fracture, dislocation	738
5.	Simple contusion	570
6.	Inflammation and infection	546
7.	Miscellaneous	512
8.	Joint contusion	430
9.	Laceration and abrasion	415
10.	Internal injury	366
	TOTAL	7,090

Source: A. E. Florio and George Stafford, Safety Education, 3d ed. (New York: McGraw-Hill Book Co., 1969), p. 450.

20% in school buildings, 11% on school grounds, and 2% caused by motor vehicle misuse. Off-campus accidents occurred in recreation 31% of the time, in residence 31%, with motor vehicles 25%, at work 4%, and in other areas 11%.

In a study on college physical education accidents, Florio (7:67) found that nearly 60% of the injuries occurred in the gymnasium and not on outdoor facilities. He recorded that the most hazardous sports were touch football, ice skating, and personal defense. The highest accident rates occurred in team and contact sports.

In Thorndike's 20-year study of sport injuries at Harvard University injuries were ranked as shown in Table 3.

Each injury must be adequately treated by a physician and effective controls developed to prevent recurrence. Most injuries in sports are not serious and heal rapidly with proper care.

Need for Local Reporting and Analysis

National data on sports accidents are now being collected by various agencies whose reports provide information on trends associated with sports hazards. Contributing also to the national data on sports accidents are the many local organizations with their recurrent accident experience. Local agencies within schools and colleges usually contribute information to the state and national agencies previously mentioned. However, national sports accident information may not meet the needs of local agencies seeking to control the hazards that are unique to their communities. In our 50 states, there are environmental conditions which differ widely and many other physical factors that alter human performance and may contribute to accidents.

The emotional or psychological climate may also alter the accidents occurring to sports participants. Some communities are very sports minded and make unusual demands of players and coaches. The violence that erupts at some international soccer contests is legendary and regrettable. Other communities that may not care to support sports programs adequately are acting detrimentally to the players. Some communities seek to jettison sports contests and recreational programs because of illogically assessed injuries, rivalries, responsibilities, or other problems that arise in lieu of finding a satisfactory solution that retains the values of sports.

Two national conferences on accident prevention in physical education, athletics, and recreation have been held. The recommendations of the safety specialists who participated in the conferences are contained in *School Safety Policies with Emphasis on Physical Education, Athletics, and Recreation* (5). Included in one section are recommendations on the reporting and investigating of hazards and accidents in sports. While the recommendations are primarily for school personnel, they are also useful to other agencies. The theme of the publication might be summarized as follows: To reduce sports accidents and prevent their recurrence, they must be investigated, causes determined, and corrective action taken. This course necessitates effective reporting and investigation of all accidents to provide information for administrative guidance, program development and evaluation, legal analysis, and equipment improvement. To assure adequate reporting and investigating of accidents, policies must be established by school boards and non-school agencies functioning in the sports and sports recreation field.

In any school system, sports facility, or community sports agency, a person should be designated as safety coordinator or supervisor. His primary responsibility should be to provide adequate sports accident reports, analyze them, and provide a follow-up account which includes accident preventive measures. Not designating someone responsible for safety reporting should reflect unfavorably on any agency. Safety is too important to dismiss lightly. Greater safety can be achieved if people want it and are ready to provide the means to secure it.

Evidence of recent concern with sports safety is apparent in *Selected Problems in Sports Safety* (1). Contained in the booklet are 16 previously published articles which may influence change in this field. They cover sports theory, skill activities, athletic training and emergency

care, as well as the legal responsibilities of sports leaders. If the principles expressed are studied and applied, sports safety will undoubtedly progress.

Community sports safety activities have been increasing all across this nation. A few are mentioned to indicate the scope of this work: *An Epidemiological Study of High School Football Injuries in North Carolina 1968-1972* (2) used research methods to produce new information on football injuries for that state and provides select input into modifications of hazard control for secondary school football nationally. The Sports Research Institute at The Pennsylvania State University has housed a number of research attentions to the role of sport in society, including safety considerations. Many hospitals have established sports clinics that are safety oriented, where emphasis has been placed on the control of hazards to sports participants and the control of athletic injuries. In time, sports safety hazards control centers, or sports trauma institutes may be established in each state and a national clearing house on sports safety may become a reality.

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Chapter 2

PHILOSOPHY OF SPORTS ACCIDENT PREVENTION AND INJURY CONTROL

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During the last 25 years, safety professionals have been questioning sports leaders about controls being used to reduce hazards in sports. Some of the safety leaders were formerly active in sports, athletics, physical education, and recreational activities; others were trained researchers. They had noted that reliable information on sports injury and accident control was very limited. Hazardous conditions in sports often were not clearly understood by players and coaches. Human and environmental factors contributing to the disablement of athletes which appeared infrequently or were of a subtle nature were neither observed nor analyzed. Generally, the causes and effects of hazardous conditions were reported and examined only when serious accidental injuries occurred. Such examinations often lacked effective measurement and were characterized by subjective judgments and specious reasoning. Less frequent injury producing conditions were unrecorded and unanalyzed and were discussed lightly in terms of luck, chance, or the breaks of the game.

The pervading philosophy of mid-twentieth century was that sports contained significant risks and players took their chances with such risks. The laws of many states denied justifiable redress when injuries occurred in sports, regardless of the capabilities of an administrator, coach, or teacher; the condition of the playing field; the equipment used; or the instruction provided to participants. Fortunately, the concept of legal liability has changed significantly and rapidly. Recent decisions tend to hold the supervisor, coach, or teacher liable for negligent performance even on the athletic field where, in the past, risk of injury was accepted and redress seldom supported. It has now become a moral as well as a legal obligation for sports teachers to develop competencies in new areas of responsibility so that youth will attain the benefits of sports and be kept free from harm.

Individual Responsibility

The development of a philosophy of safety in sports is essential if reductions in the frequency and severity of sports injuries are to come about. The individuals who should be primarily concerned are the participants in competitive and recreational sports activities, their coaches and teachers, the administrators of the varied sports programs, those who design and sell equipment and facilities, spectators (comprising family and friends), and others who enjoy sporting events. Physicians who pronounce individuals fit for vigorous activities and those who assist in injury treatment should also be included.

Sportsman. The sports participant may ask: What are the joys this activity holds for me? What are the chances of injury? Does the sport have a degree of danger that is a challenge for me? Can I overcome the risks? At what point do I decide to find an alternate activity? Seldom does he ask if disablement might result. Joy, fun, organic growth, adventure, and self-testing are the results the player seeks. Rarely does he believe that a capable performer will become the victim of a disabling mishap. If injury occurs he may state that it was preordained. Seldom will he admit that ineptness or some other personal factor was the cause of the injury.

Coach and mentor. The coach may ask: What are my responsibilities to my players, my institution, and the community? Am I in this job for love, money, recognition? Must I always win? What are the trade-offs? What are the anomalies that subject some participants to unsafe risks? Do I know them well? Do I protect players from their own inherent weaknesses? Have I been fully prepared for this professional role? If someone is hurt will it be my fault? Where can blame be placed? Must the blame be placed?

Parents. The parents may well ask: Is this the sport for my youngster? What will it do for him? Is it safe or unsafe? Is there another way of achieving the same goal? Parents in our society realize that team and individual sports and vigorous recreational sports activities contribute to a youngster's growth and development. However, at times they read news items that highlight danger or inordinate risks. In haste they wish to ban participation in a sport. They often do not consider how the sport can be made safe or how injury can be controlled by effective instruction, good administrative controls, and appropriate participant behavior. What choice exists for the youth who might drive a sports car at excessive speeds instead of playing football, experiment with drugs in lieu of finding his potential in sports or academic contests, or seek escapism in place of reality?

Administrators. The administrator may ask: How does this activity contribute to the growth and development of the participants for whom I have a major professional responsibility? Has this community provided adequate support for the activities in our program? If funds are lacking what priorities do I set for the community? Do we have an effective staff to provide good leadership? Will I provide the leadership to place sports in their proper perspective in my community? Do I accept the thesis that sports injuries can be minimized by good administrative controls?

The general thesis expressed in this chapter is that it is possible to reduce the frequency and severity of accidents and injuries to players in sports, athletics, physical education, and recreational sports, in or out of school, for young or old, male or female. To achieve this goal, sports activists must develop a philosophy which includes an understanding of the: (a) factors of accident causation, (b) principles of accident prevention and injury control, (c) responsibilities of individuals who participate in sports and recreation, and (d) relationships that evolve from community action.

Factors and Causation

The search for the cause of sporting accidents is no different from the search for the cause of any accident. Researchers have looked a long time for factors of accident causation in industry, traffic and transportation, and in the home. Only recently have they become concerned with the recurrence of sports injuries. Man seeks simple explanations for complex events; accidents are complex and the search for causes may be very frustrating.

Accidents and their injuries are so varied in the surrounding circumstances that no single factor can be expected to stand out prominently. One underlying truth is evident — at the base of any accident are human factors (physiological, psychological, biomechanical, or biochemical), singly or in combination, with social or cultural variations. These factors would be meaningless without reference to the nature of man's work or play, the manner in which they are carried out, and the complex aspects of the environment. Accidents appear to be, as Brody

has stated: "a matter of functional disharmony or imbalance between man and environment". (7:3)

Various authors in accident research avoid the words *cause* and *causation* or use *cause* as a synonym for the mechanism of injury, without indicating how the injury came about. Another approach is noted in epidemiological studies where *causation* is considered more than an agent directly involved — rather it is a combination of the host, the agent, and the environment (10). It is desirable to ask if there are any common factors without which accidents do not occur. Damage to living and nonliving structures fall causally into a few groupings. These groupings reflect abnormal energy exchanges which may be thermal, mechanical, electrical, or ionizing and require mitigation of these abnormal exchanges for the prevention of damage (10).

To begin to understand how various factors contribute to man's accident experience the physiological, psychological, and social human factors will be discussed more fully. The environmental factors to be considered are the physical, thermal, radiological, and electrical. It is also necessary to indicate what part chance plays in accidents.

Human Factors

Physiological. When physiological equilibrium is attained by a person his accident potential should be at a minimal level. Hundreds of studies, although relatively few in the sports field, show that man's physiological dysfunctioning contributes to many kinds of accidents (11). Some of the individual characteristics high on the physiological level related to accidents include: sex, age, emotivity, fatigability and fatigue, visual function, perception, attention, alcoholism and drug use, and changes in health. In some studies, women exposed to hazards have more accidents at certain times during the menstrual cycle. Women have a greater susceptibility to toxic substances and such factors may trigger an accidental event. Age, associated with physiological body changes, has often been related to accidents, although the evidence points primarily to psychosocial origins. Yet advancing years, and the concomitant chemical changes, do lessen neuromuscular efficiency.

Fatigue (physiological as differentiated from the more prevalent psychological variety) is an accident variable long noted. The tired gymnast, runner, or football player may misjudge and become involved in an accident. Another factor in accident causation, visual dysfunctioning, may stem from nutrient imbalance and its effect is to lessen perceptual awareness. Lastly, alcoholism and drug abuse alter human performance in athletic neuromuscular skill demands and may contribute to injury.

Psychological. Accident experiences in sports touch all phases of psychology. Simple human responses to sensory stimuli such as depth perception, spatial discrimination, reaction time, and kinesthesis are also of concern to sports participants and coaches. Neophytes in sports who react slowly to opponents moving forcefully toward them may collapse under the impact.

The application of learning theory and decision making responses affect players' responses. The study of human growth and development provides insight into skill acquisition. Learning skills, by degrees of difficulty, through progressive motor learning stages is essential to accident and/or injury avoidance.

Behavioral deviations may affect the safety of sports performers. These may be emotional disturbances of chemical or organic origin and may be chronic or acute. Excitement in or at sporting events may produce adrenaline flow which leads to actions that may or may not be effectively controlled. Aggression, a trait necessary for success in competitive sports, is also found frequently in persons whose accidents are not in the arena of sports activity.

Accident repeaters are superior in gymnastics and in crude strength. Individuals in team sports differ from persons in individual sports in psychological variables. Individual sports participants have a need to stand out and also have a higher accident record. Most coaches assess the drives and motives of players with considerable skill and attempt to control

aggression and stress that may become hazardous. Stress is present in most accident situations and is usually of psychosocial origin.

Social. The social climate in sports and recreation cannot be separated easily from the psychological factors when considering human behavior. Man is a gregarious creature who seeks companionship and recognition. He plays in sports not only to test himself but to be with others and to gain self-respect. Family pressures may influence a youth's selection or rejection of a sport. His very interest in sports may be secondary to achieving other goals. The parent who urges his son to be a chip-off-the-old-block and play football as dad did in college may set the stage for demands that a youngster may not be able to meet. An accident can then become the escape vehicle for getting the youth out of the sport he did not want to participate in at the outset.

Environmental Factors

The complexities of a highly technological society introduce many environmental factors that are helpful as well as harmful to man. The old adage, "if you cannot stand the heat stay away from the fire," has some applicability to participation in sports. Discussed here are several of the environmental factors associated with accidents in sports and recreation.

Physical. Man's physical tolerance of pain, stress, and other forces varies considerably. Astronauts are selected and trained to meet exceptional demands for physical performance. Superior athletes can perform feats of physical strength or dexterity that are impossible for many persons. Individual differences are well-known. Man can go only so far below the sea or so high above the land before the pressure of water or the absence of atmosphere will destroy him. In competitive games two bodies cannot occupy the same space without the risk of injury. Noise from a crowd can drown out signals and well laid plans may fall apart. Pollutants in the atmosphere may impair performance in poorly ventilated sports areas. Excessive air pressure in inflatable sports equipment may harm the user because it is too hard for the hand to manipulate. There is no limit to the number of physical factors that may cause accidents or injuries to persons who are unaware or uninformed about hazards.

Thermal. Man can tolerate relatively small variations in heat before he experiences discomfort. Excessive external heat such as sunburn, fire and firehurns, acid and alkaline burns, and hot water contribute to his impairment. When man's limits for external heat are known it is hazardous to exceed them.

Excessive internal heat can cause death. If the body does not sweat when subject to high temperatures and high humidity, heat stroke may cause injury or death. Sports conducted in temperatures at or above 80 degrees, with the humidity more than 70%, require careful observation for early signs of heat exhaustion and heat stroke.

Electrical and radiological. In the sports field, electrical and radiological insults to participants are comparatively rare. Lightning deaths on golf courses or athletic fields strike about 50 persons annually in the United States; appropriate precautions are necessary to avoid this situation. Electrical equipment used at sports contests must be installed and handled by electricians to avoid danger to sports participants and spectators.

Chance. Human factors and environmental conditions may not be in the *right* combination for an accident ot occur. Chance enters into an accident-prone situation. By chance, existing conditions may produce a severe accident or a near-miss event. For example, a face bar on a football helmet passed inspection, although defective. It was used for many hours of play. The wearer was never struck on the face in play and no stress was placed on his face bar. On inspecting equipment, the coach noted the absence of a proper anchorage on the helmet, and with a slight blow, broke it. Had it been struck during play a serious injury might have resulted. Yet, through chance, no injury occurred. A high platform diver struck a shark and sustained a severe injury. The chance of a shark being in that area was remote and the likelihood of a diver hitting one was even more remote and yet that event happened.

There may be no statistical correlation between certain events and accident involvement, but a potential correlation is always present. Therefore, it is desirable to study the activities and the working conditions for sports in order to detect those frequent near-misses which show that a sport is not *right* or has a chance of producing an accident and harm. Breakdowns in systems can be detected by analytical epidemiological procedures and curbed long before statistical data begin to identify *wrong* conditions. Then efforts at correcting human and environmental conditions can be coordinated.

Near-miss. Near-miss refers to conditions surrounding an event that might have produced an accident, but did not. An example of a near-miss is a diver who enters the water from a three-meter board and brushes past another diver who has left a one-meter board improperly. A collision of two divers might produce an injury. Certainly, proper use of the boards should prevent collisions. A bus carrying a football team to a game experienced brake failure causing the bus to coast down a hill and roll to a stop on an upward slope — with no one hurt. Similar events would indicate a breakdown in some part of a system. Analysis and study should keep possible system breakdowns to a minimum. In sports it is wise to report all near-misses to responsible administrators. This will foster accident prevention measures and will prevent innumerable mishaps.

Risk. Risk is defined as the possibility of suffering harm, loss, or danger. Risk stresses chance or uncertainty, but often from the viewpoint of one who weighs them against possible gain or loss. The term may also imply involuntary exposure to harm or loss. Risks abound in sports, athletics, and physical education and are controllable to a significant degree. Some sports carry higher risks than others. What is needed is an effective method of assessing the risks involved in many of life's activities, including sports.

Risk acceptance. Risk acceptance implies a willingness to chance harm, loss, or injury. What constitutes an acceptable risk is a matter of personal and/or public analysis of danger. When risk factors are known one may calculate whether the potential benefits exceed the potential hazards. In sports, many risks are evident and a personal decision must be made by a player after careful calculations have been made. The decision also may be the function of a coach or an administrator. While a player may risk playing with an injury, his coach or team physician should be unwilling to have him take that risk. Environmental conditions may be hazardous, and while a team might be willing to take the risk and play, conference regulations might prohibit play when the temperature, humidity, or other factors exceed safe levels of human tolerance. What is needed in sports is a more effective way of assessing the risks that are reasonable to accept and more precise ways of defining those risks that reflect unwise or even stupid decisions (8). Until such methods are refined, risk should be exercised with caution. Remember, it is the sports participant's welfare which should be of utmost importance; to risk a player's safety is to compromise one of the major goals of sports — to build healthy bodies.

Principles of Prevention

In the developing art and science of accident prevention and injury control the concept that *accidents are caused and do not just happen* has done much to destroy the illusion that accidents are uncontrollable and must be accepted stoically. Accident research has helped to identify significant factors in accident causation and to make accident reduction feasible. Much is known about factors that set the stage for a hazardous condition; less is known about motivating individuals to use available controls.

An engineer designs structures to make it difficult for accidents to happen. An enforcement specialist requires compliance with behavioral standards to control hazards. An educator attempts to develop the ability in students to make wise choices and effective decisions in the presence of danger. These professional disciplines aid in the safety achievement effort through exchanging information. Significantly in sports (where injuries are fewer than in traffic, at work, or in the home, and the acceptance of sports injury is often tolerated), professionals in the

field have done little to improve conditions in terms of recurrence of injuries.

Safety is achieved to a significant degree by providing youth and adults with attitudes, skills, and knowledge about hazards and their control. Hazards are everywhere in our environment. Their control can be achieved through the effective application of four fundamental principles:

1. Recognize the hazards
2. Remove hazards where feasible
3. Control hazards that cannot be removed
4. Create no additional hazards (5:8)

Recognition of Hazards

An understanding of the hazards of any sporting activity requires a thorough knowledge of that sport: equipment and facilities, the leadership provided, fitness requirements of the participants, nature of the skills necessary for success, and the demands placed on personnel involved in the activity by themselves and their community (17, 20).

The possibility of drowning is recognized by water sport enthusiasts. These enthusiasts generally try to develop the skills associated with the particular water sport. But some of them do not. For example, scuba divers who have not learned well the physics and physiological requirements for the use of air at varying depths, and the need for carefully timed ascent and decent, will experience difficulties. Also, any physical anomalies, like intestinal distress or a head cold, may impair the scuba diver's performance. In one incident, 24 sky divers jumped into clouds without knowing that a lake was under those clouds; most of them lost their lives by drowning.

Football is a contact sport. Collisions and innumerable stresses and strains are placed upon players. Not knowing how to meet the impact of a hard tackle and fall properly could result in an injury. Fundamental skills must be practiced and physical conditions must be good to enjoy playing football. Equipment is designed to protect players and must be used for the purpose intended. Worn, improperly fitted equipment increases the risk of injury and must be avoided.

When a football field is not adequately maintained small holes, stones, or broken glass may cause injury. Knowledge of proper field maintenance is essential for controlling hazards.

Where leadership in a sports activity is effective, accidents and injuries are curbed. Coaches who are well trained and well informed have a capability for transmitting much of their knowledge to their players. Also, the officials who control sports contests have an essential role in preventing injuries through their quick detection of dangerous infractions of rules or an emotional climate that may be explosive The dangerous practices of unnecessary roughness and piling on can be controlled by effective officiating.

Sand lot football is dangerous because of poor officiating, inept coaching, no medical staff, and poor equipment and facilities. Such factors often lead to recurrent accidents and injuries. Intramural sports activities, with their high rate of injuries and accidents, reflect untrained participants, inept coaching, untrained officials, and frequent overcrowding of facilities. It is definitely possible to control accidents and injuries in intramural sports and sand lot football, as well as in all other sports. A knowledge of incipient hazardous conditions is helpful in applying effective controls.

Removal of Hazards

Often in recreational sports and physical education, when administrators believe an activity is dangerous, that activity is dropped. Accidents that recur in many sports can be greatly reduced when known hazards are removed. It is far better for authorities to continue a sport for the values it has than to jettison it for failure to apply effective controls, including analyzing accident data fully and finding better measures for controlling injury.

When environmental conditions are hazardous, the responsibility for removing danger falls

on the persons in charge of an activity. When the danger of lightning is evident, a lacrosse game, a golf match, a surfing contest, or a sailboat race should be stopped by the officials. Where a playing surface is not level, where floors are needlessly slippery, where lighting is inadequate, where air pollution of an arena is recognized, the administrators need to arrange for better maintenance of the field, provide slip proof compounds on floors, and improve lighting and ventilation before scheduling the facilities for use. When it is suggested that worn or outdated equipment be used, a coach and the community should refuse to play until safe equipment is assured.

Hazardous human factors that may be controlled include the following: unequal competition, too many contests in a short time interval, insufficient conditioning prior to participation, inadequate medical detection of anomalies which bar sports participation, inept skills, too little knowledge of the sport and attitudes of extreme risk taking. Sports authorities need to plan carefully to equalize competition; to control the frequency of contests and length of the playing season and pre-season training; to set the requirements for efficient medical examinations of all participants; to provide for the progressive development of sports skills, training, and education in the fundamentals of a sport; and to give leadership to the development of desirable attitudes for safe sports participation.

Compensation for Hazards that Cannot be Removed

When it is impossible to remove a hazard, compensate by developing intervention techniques or using other controls. While no safety device is perfect, research will provide information on the most valuable procedures to employ. The mouth protector in football, the hard hat in baseball, the wet suit for cold water sports, and the aluminum cup in boxing are examples of devices which compensate for an inability of the organism to withstand impact or discomfort without assistance. The water skier who wears a carefully selected life belt will be held afloat until his towboat crew rescues him in the event he has lost his breath in a fall. Legislation requiring two men in a motor boat that is pulling a water skier is a form of compensation since the boat driver cannot watch the water ahead and at the same time be fully aware of what the skier is doing behind him.

Effective leadership should provide students, players, and sports recreation enthusiasts with some of the procedures for progressive skill training, information about improved safety devices, and advice on other controls. It is essential to compensate for or adjust to those hazards that cannot be removed. To do less might cause injury.

Avoidance of Additional Hazards

Any factor which reduces a player's performance capabilities will endanger his participation. Factors may be physical, physiological, or psychological. Alcohol is a depressant. The danger of drowing increases when the alcohol level in an individual mounts. The skills of sports car racing or piloting a plane are hampered by the use of alcohol. Using alcohol or other depressants increases the hazards of any activity requiring clear thinking. There is a popular notion that some drugs enhance the physical powers of man. Medical science knows no substances: "... a well-trained athlete's performance cannot be improved pharmacologically." (12:58)

Unequal competition sets the stage for injury and accidents. Performers who are outclassed in skill or weight or other variables may not achieve success. The middleweight boxer who enters the ring with a heavyweight opponent is giving up a marked advantage to the heavier man. The overfatigued golfer may be forced to retire from a match if exhausted from too many contests scheduled with too short rest intervals. In a physical education class mismatched opponents in a line soccer game resulted in a broken leg when a 95-pound youth kicked the ball at the same time his 190-pound opponent did. A charge of negligence against the teacher was

sustained in the courts and damages awarded the smaller youth.

Poor equipment and inadequate facilities often result in injuries to players. It would be better to alter the sport until effective equipment, facilities, and leadership are provided.

Individual Responsibilities

Man's safety is a public responsibility; it is also a personal responsibility. When the public rejects hazardous activities and dangerous equipment, a national philosophy of safety is expressed. Public acceptance of automotive deaths has been strained. Demands for less product failures, improved roads, and better drivers reflect public annoyance with traffic experiences. The personal acceptance of the role each driver must play in contributing to safer driving is being stressed with motorists. Similarly our concern with sports injuries and deaths is reflected in news reports and in professional journals and publications. The public displeasure with needless injuries creates demands for controls. The awareness of individuals that safety is also an individual responsibility evolves from a realization that personal safety is not completely provided by others.

In the safety field it is sometimes said that what is everyone's responsibility is no one's concern. To tell all persons to be safe will probably influence no one. To alert each individual to his personal prerequisites for safe behavior in a complex environment has long been the concern of safety educators.

Each individual must learn to apply the fundamental principles of safe behavior in the presence of hazards. The principles of coping with and not creating additional hazards must be applied by individuals as they approach any activity. In sports, physical education, and athletic fields, considerable effort is expended by groups to provide for the safety of participants. Beyond that effort each participant assesses his capacity, motivation, risk acceptance, and attitudes relative to each activity in which he will participate. Listed below are important principles in such a personal assessment:

1. Study the sport and the hazards within it as you advance in skills and participation in that activity.
2. Determine your physical and emotional fitness to meet the demands of an activity. (Use medical and other counseling opportunities for objective assessment of your readiness and avoid the use of only subjective judgment.)
3. Learn what the limitations are in the equipment and facilities.
4. Use equipment, facilities, and supplies only for the purpose intended.
5. Refuse to participate in a hazardous activity unless protective equipment is properly fitted and provided.
6. Secure instruction from qualified personnel. (It is better to learn from the experiences of others than to experience misadventure initially by oneself.)
7. Keep others informed of what, where, and when you plan to go before entering an area known to be hazardous.
8. Act your age.
9. Use progress on in skill development; become proficient in simple skills before moving on to more advanced ones.
10. Be ready in advance to send for assistance if it is needed. (Example: the first aider who always carries a dime for a phone call, or, the coach who carries the roster and home addresses, names of parents and physicians of players in the event consent for medical treatment or other problems arise when on a trip.)
11. Develop through practice a neuromotor conditioned response system that will be ready and able to cope with hazards immediately.
12. Provide for prompt and effective medical treatment of injuries and insist upon an adequate follow-up treatment to make possible a quick return to participation.

13. Accept your responsibility for your fellow man; assist him to achieve safety in the presence of danger. (17:91-93)

These principles may be more fully analyzed by each individual who assesses his personal responsibility for safe participation in sports and athletics. Anyone engaging in sports must set desirable goals for himself and those who share activities with him. Most of the accidents in sports are caused by human behavioral faults, including an omission or commission of an act in the presence of danger. Perhaps 60% to 70% of accidents in sports and recreational activities can be eliminated. Self-discipline and a sense of personal responsibility are important if one is to live safely in the presence of hazards.

Community Relations

The individual alone cannot solve the problems of hazard and injury control in sports, athletics, and physical education. Group understanding and community action are essential. Additional research on sports injury is needed, and since individuals alone cannot take on so large a task it must be supported by professional organizations. Efficient methods of sports injury control need to be applied by communities for the safety of all individuals.

Each community may determine the kind of safety it wants and is willing to buy. Action programs for safety have been established in many communities. Local safety councils and committees have been formed to attack specific problems. Generally, they have started with an attack on traffic deaths and injuries, moved on to work, industrial and home injuries, and then to the schools' responsibility for safety education. Safety committees may establish substructures which will concern themselves with more confined areas, such as sports safety. In turn such committees, while considering local community problems, also become involved with other agencies expressing concern in the same area. Local medical groups have formed sports injury control committees with other professional persons and some participate not only locally but nationally with the American Medical Association Committee on the Medical Aspects of Sports or the former American Association for Health, Physical Education and Recreation's Safety Education Division. Publications like *School Safety Policies*, *Annual Safety Education Review*, and *Desirable Athletic Competition for Children of Elementary Age* are examples of printed materials designed to influence local action for the welfare of sports participants. (2, 3, 4, 5)

More recently, the American School and Community Safety Association (ASCSA) of the American Alliance for Health, Physical Education and Recreation has compiled into one booklet a number of significant articles on sports safety. Its title is *Selected Problems in Sports Safety*. (1) The ASCSA frequently includes items on sports safety in its quarterly newsletter, *The Forum*. At times research efforts on sports safety are reported in the *Journal of Safety Research* published by the National Safety Council, Chicago, and in their quarterly, *Family Safety*. The *Medical Tribune* (Weekly) frequently abstracts sports safety items for their readers. A National Conference on sports safety was held in Cincinnati in 1973 and more recently in October, 1976, a second National Sports Safety Conference was sponsored by ASCSA.

Efforts of this kind will continue until a larger nucleus of sports injury control personnel communicates effectively with community leaders to achieve greater sports safety for our increasing number of sports participants.

Schools in every community are expected to provide instruction in safety, a safe school environment, and proper safety services. If youth are taught safety well, much of what they learn should last them a lifetime. Obviously, schools cannot guarantee an accident free life. Therefore, other agencies are formed to influence the public. These include adult education, the news media, the courts, and many others. A foundation for effective living is initiated in the schools. Each school establishes basic policies that give a direction to be taken in its school

safety program. Such policies are described fully in *School Safety Policies*. They cover efficient planning where students, teachers, administrators, school board members, parents, community agencies or governmental groups, and interested citizens work together to determine the size, scope, methods, and evaluative procedures that need to be used for safety achievement in a community. Plans for all probable hazard control problems must be developed by such responsible individuals and groups through adequate organization and programming, efficient use of personnel, and proper evaluation.

Other approaches covered in *School Safety Policies* are concerned with curriculum and instruction; facilities, equipment, and supplies; first aid and emergency care procedures; and reporting and investigating of hazards and accidents. Such policies are discussed more fully in the next section of this monograph. Out of these broad policies a large number of principles and procedures and practices may be developed to serve the needs of any school or recreational organization.

From the foci of community schools, safety policies may be dispersed providing for community sports and recreational activities including playground, athletic, and individual sports programs like golfing or boating, or any of the 50 or more activities covered in the sports section of this series of monographs. Other organized groups like little leagues in football or baseball may participate in various safety programs and apply some of the school safety policies to fit their particular needs. A community safety council may keep alert to any increase in accidents or injuries in particular sports and initiate a public education effort through various media to inform, motivate, and influence behavior in a direction that is designed to reduce mishaps. When specific problems arise, communities may support research activities to determine if education, engineering, or enforcement procedures offer the best means for controlling failure to achieve safety in a particular sport.

The broad nature of sports activities takes outstanding athletes into competition in the world community where international controls are established and then changed as conditions require. Analysis of sports injuries and accidents to international performers provides information which may enable local controls to be established for sportsmen.

Significantly, accident rates continue to be highest in those categories that involve personal responsibility. Fine work and even industrial safety records are marred by personal carelessness, irresponsibility, or lack of cooperation. The idea that accidents happen to the other fellow has mitigated against the development of personal safety habits and responsibility. In time, an enlightened society may develop more fully the concept that accident and injury control is every individual's responsibility and concerns the world community.

Life without risks might provide few adventures, if any — there would be few challenges in sports. We must continually move on in the presence of risks. Yet if man will assess these risks, abandon those that are inordinate, control those that can be controlled, and create no unnecessary hazards, he will gain much from sports participation and receive the benefits that sports hold in store for him.

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Chapter 3

AN INTRODUCTION TO ADMINISTRATION AND SUPERVISION

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Administration deals with the executive actions of those charged with facilitating the efforts of people in accomplishing a definite purpose. It is the school administrator who has the responsibility for an overall safety program. His attitude and knowledge will determine the effectiveness of the program. His chief task is to manage both human and material resources. In managing these resources he provides adequate supervision to handle both curricular and noncurricular activities.

The functions of administration and supervision overlap depending upon the size of the organization. A school principal, for example, might be a supervisor in a small organization. The supervisor's role at times entails administrative responsibility.

While supervision generally is concerned with the improvement of instruction, it has a broader scope in relation to a safety program. In addition to curricular matters, the safety supervisor usually is responsible for providing a safe environment, safety services, and for conducting safety program evaluation. The specific activities of a safety supervisor are to:

1. Help the entire school staff see safety education as an integral part of the curriculum.
2. Develop instructional guides for use by all teachers.
3. Identify the safety needs of pupils and plan cooperatively.
4. Appraise existing curricular content for safety education adequacy.
5. Know the sources of current safety materials for both student and teacher use.
6. Work with teacher-sponsors of school safety organizations (safety councils, safety patrols, safety committees, and safety clubs).
7. Use accident reports as a preventive, defensive, protective, and/or constructive device.
8. Inform the school staff of legal aspects involved in safety.
9. Secure the cooperation of out-of-school agencies for service and assistance.
10. Guide teachers in selecting safety education materials.
11. Publicize and interpret the school safety program to the public.
12. Exert leadership in organizing and conducting emergency drills.
13. Cooperate with the school administrator and regulatory agencies in removing building and general safety hazards and in planning for future activities.
14. Appraise the suggestions and criticisms of community groups regarding the school safety program.
15. Cooperate with community agencies in serving as a speaker, in supplying the names of speakers, and in securing instructional aids.

16. Keep informed on the latest developments in the safety field.
17. Cooperate with the school administrator in conducting in-service educational programs for all staff members including custodians, bus drivers, and luncheon personnel.
18. Assist and encourage teachers to undertake safety research projects.
19. Take an active part in community safety activities for they have an influence on the total school safety program.
20. Evaluate the school safety program.
21. Enforce breaches of safety rules and regulations and administer consequential disciplinary action.
22. Present to personnel progress reports relevant to safety program goals.
23. Develop criteria for use in personnel selection.
24. Supervise or assist in the selection, training and education of qualified staff members.
25. Evaluate and rate safety staff and instructional personnel.
26. Inspect environment and evaluate safety services to assure adherence to legal regulations.

It matters not so much whether a safety supervisor is responsible for the preceding activities. The important point is that within every organization there should be someone responsible for these activities. His title may be supervisor, coordinator, director, consultant, specialist, or anything else which concurs with local administrative policies.

General School Safety Policies

A policy is a statement which gives direction for achieving a desired objective. The area of administration and supervision usually operates through policies. The following policy statements can provide a sound safety program.

Planning.

1. In establishing policies, participation should be invited of all persons and groups concerned: students, teachers, administrative staff members, aides, school employees, board of education members, parents, representatives of community or governmental groups, and other interested citizens.
2. A faculty-student-staff committee should be organized to advise on accident prevention and ways of achieving safety.
3. Provision should be made for the use of advisory services from professions, such as medicine, law, insurance, engineering, psychology, and safety, to help plan and evaluate accident prevention procedures.
4. All schools should have a comprehensive school safety program, including safety services, education, a safe environment, and administration and evaluation.
5. Schools should have an accident reporting, investigation, and recording system as well as follow-up procedures.
6. Administration has the responsibility for adherence to provisions of school law; federal, state and local laws, codes and ordinances, and contractual agreements.
7. School officials should develop cooperative relationships with official agencies such as fire, health, and policy departments, as well as private enterprise and voluntary interest groups.
8. Adequate insurance programs should be maintained by all schools, with details of the coverage and limitations understood by all school personnel and students.
9. Parental approval should be obtained in writing for student participation in activities that remove students from their normal school routine.
10. The school should make detailed plans for handling all anticipated emergencies.
11. There should be a detailed plan for the safe handling of spectators and crowds and controlling the resultant pedestrian and vehicular traffic at all school activities and events.

12. Recommendations for building requirements and review of plans should involve teachers and other school personnel; thus architects and engineers, in developing safe facilities, can be made aware of potential hazards recognized by an experienced staff.
13. Every school should have a well defined plan for handling emergency care problems, including parental approval for transportation and emergency medical care. Arrangements for emergency care and transportation should be made in writing at the beginning of the school year.
14. The content, objectives, structure, and teacher qualifications for driver, traffic and safety education should conform to nationally recommended standards.
15. Special arrangements should be made to assist handicapped persons in achieving safety in the presence of environmental, interpersonal and other hazards.
16. Conferences, workshops and in-service sessions should be held to develop instructional techniques and methods best suited for teaching safety subject matter.
17. Safety program goals should include attempts to assure that all school jurisdiction activities take place under conditions that are both healthful and safe according to standards promulgated under the federal Occupational Safety and Health Act of 1970.

Organization and Program.

1. Each school should designate a school safety coordinator to direct the total loss control program.
2. Provision should be made for the development of a comprehensive safety education curriculum.
3. Major consideration should be given to factors such as scheduling, class size, and grouping, which have a bearing upon the thrust of accident prevention and control efforts.
4. Specific accident prevention procedures should be developed for the movement of students within school, to and from school and in school sponsored activities.
5. All safety rules and regulations should be included in the school's administrative handbook.
6. Published materials dealing with safety should be included in the school library and available to all personnel.
7. A specifically appointed program coordinator should be assigned to work with all persons concerned with planning provisions of safety education experiences.

Controls.

1. All students and staff members should be familiar with their responsibility to report immediately any hazardous condition, dangerous activity, property damage, and injury, in accordance with established procedures.
2. All school personnel should be familiar with and adhere to rules and regulations governing safe practices and procedures.
3. Close supervision should be provided wherever students participate in potentially hazardous activities.
4. All safety rules governing the use of facilities, equipment and supplies should be conspicuously posted at predesignated areas.
5. Regulations regarding the use of school facilities by nonschool groups should include specific provisions for safety and accident prevention. Copies of these regulations should be provided to all concerned.
6. Information about the health status of students and school personnel should be made available to appropriate staff.
7. Approval from a physician, with notification of any activity limitations, should be obtained before any student is readmitted to school after a serious injury or illness.

8. Only equipment and supplies that meet highest standards of safety should be purchased and used by schools.
9. Students should be required to make proper use of protective equipment in hazardous activities.
10. Equipment, devices, materials, or animals which may be potentially dangerous should not be allowed on school property without prior approval of appropriate school officials.
11. Periodic safety inspections by qualified persons should be conducted relative to all environmental features dealing with school buildings, grounds and equipment.
12. Housekeeping and maintenance procedures should assure order, cleanliness and proper functioning of equipment and facilities.
13. All buildings and equipment used for educational purposes should meet applicable standards as outlined by law.
14. Areas requiring vehicular and traffic control should be equipped with the necessary signals, signs, lights or other safety devices.
15. Accidents should be investigated, recorded upon appropriate forms, analyzed and periodically reviewed to determine accident prevention needs.
16. Periodic conferences should be held to insure that safety program efforts are being carried out according to approved policies.

Personnel.

1. All personnel should be adequately oriented regarding the school safety program and the responsibilities of their specific roles in accident prevention.
2. All instructional personnel should be currently certified for their area of instruction.
3. Noninstructional personnel of the school, such as bus drivers, recreation aides, and custodians, should be qualified to carry out specific safety assignments.
4. Teacher preparation institutions should provide for preservice education in safety for prospective teachers and administrators.
5. School personnel should be informed of new findings and recommended practices in accident prevention and injury control.
6. In-service programs for institutional and non-institutional personnel should be scheduled at regular intervals during the school year.

Evaluation.

1. A system should exist for appropriate inspections, audits, and evaluation of facilities, equipment, records, and buildings as a basis for improvement.
2. There should be a system of accident investigation and reporting to provide information for evaluation.
3. Evaluation procedures and safety standards should be periodically reviewed and updated.
4. Results of safety program evaluation should be formulated into a written report and distributed to appropriate individuals so as to provide a functional guide for future modifications and improvement of the overall safety program.
5. Operational effectiveness of safety program components should be partially judged in terms of the degree that minimum policies recommended as guidelines have been successfully implemented.
6. Extent of compliance with policies should be reviewed annually by the school safety program coordinator and safety committee.
7. The safety program curriculum should be evaluated in terms of learning experiences, courses available, content, resources utilized and personnel qualifications.

The preceding policies are broad statements which deal with a comprehensive safety program of which a sports safety program is a part. The policies offer a baseline for judging the

extent to which the comprehensive safety system components have been established and how well these components function.

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Chapter 4

ADMINISTRATION AND SUPERVISION-INSTITUTIONAL CONTROLS

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The task of providing for the safety of participants in physical education and sports programs includes institutional controls which refer to administrative and supervisory policies and procedures within the school or college. Administrative and supervisory personnel as well as teachers, coaches, trainers, and students must understand their roles in providing for the welfare of the participant in sports and other physical education activities.

Part of the American tradition of education is that the public schools should be responsive to the will of the people and the curriculum reflect the needs of the community. States delegate to boards of education the authority to control and maintain schools. The board of education, in most cases an elected body of between five and fourteen members, makes policy and legislates for the schools within its system. One of the board's most important single tasks is the selection of the superintendent.

The superintendent becomes the educational leader and chief educational officer of the community, responsible for the implementation of the board's policies. He may work as an individual or delegate powers and operate from a large central office, depending upon the size of the school system. A delegate responsibility of many medium to large school districts is that of the safety supervisor. The safety supervisor serves in a staff relationship to the superintendent. His functions include:

1. Determination and coordination of safety policies
2. Development of safety curriculums.
3. Improvement of instruction in safety.
4. Development of improved community coordination in safety.
5. Evaluation of the effectiveness of the safety program (6:301-303).

The principal, coordinates his safety efforts with those of the superintendent and/or his delegated representative. Frequent and good communication between the principal and central office keeps the superintendent aware of the progress of the safety program within the schools. Frequently, because of the school size and the resulting complexities of his position, the principal will delegate the responsibility for the school safety program to the assistant or vice principal.

With regard to the reduction of accidents in the school physical education, athletic and recreational programs there are some specific measures that the principal can carry out.

1. In program planning and scheduling the principal should avoid the overcrowding of classes and attempt to group pupils in classes according to their age and grade classification.

2. The principal should expedite the repair of equipment, supplies and facilities whenever deemed necessary and also carry out plans for structural changes which benefit the program and promote safety.
3. To familiarize himself with the various safety aspects of the program, the principal should frequently visit physical education classes, athletic contests and practices and the recreational sports program.
4. The principal should exercise his supervisory duty on a periodic basis with regard to teachers and coaches in the physical education and athletic programs.

The department chairman or director of physical education and athletics is responsible for insuring safety within the various facets of his program. He works in close cooperation with the school district safety supervisor and with the individual school safety officer. His safety responsibilities include:

1. Adoption of a uniform procedure for the reporting, recording and investigation of all accidents within the program.
2. Provision for inspection and maintenance of safe equipment and facilities including safe storage.
3. Provision of first-aid and emergency care for all injuries as well as any indicated follow-up medical treatment.
4. Securing of certified and qualified teachers, coaches, trainers and officials.
5. Formation of an accident prevention and injury control committee
6. Provision for safe transportation of athletic teams and other sports participants.
7. Formulation of special emergency procedures for fire and other disaster emergencies.
8. Approval of the course of study in physical education as well as the contests scheduled for the athletic teams and other sports participants.
9. Adoption of recommended procedures for crowd control at athletic contests.

Physical education teachers, coaches, and trainers are in the best possible position to influence their students regarding safe participation in sports and athletics because of the daily personal contact they have with them.

Through their own practice and teachings, they can most readily instill in their pupils desirable attitudes, knowledges and skills concerning safety, such as:

1. Recognition of hazardous situations and their prevention and/or control.
2. Avoidance of unnecessary risks.
3. Carrying out of rules and regulations in sport and athletic participation.
4. Importance of appropriate amount and type of warm-ups and conditioning as well as proper skill development.
5. Necessity for being alert during activity participation.
6. Understanding the importance of wearing protective equipment as well as personal wearing apparel commonly prescribed for the various activities.
7. Learning activity techniques by progressing from the simple to the complex in graduated stages.

SPECIFIC ACTIVITY CONTROLS

Classification and Grouping.

It is apparent that one of necessary administrative controls for achieving safety in physical education classes is that of placing pupils in their classes on an age-grade basis.

Within classes as well as in the intramural and interschool program, classification must take place to insure safe participation. One of essential ingredients in the prevention of accidents and resulting injury is the development of skill in the activity or activities in which one intends to participate. The skilled person uses his body more efficiently than the unskilled. According to Hein (5) it is the awkward unskilled player who, other things being equal, most often injures

himself or others in physical recreation activities. It is apparent then that inequalities in ability levels pose a serious safety problem if the skilled and unskilled are competing against each other, particularly in the contact sports. The implication for teachers and coaches of sports and athletics is that they classify their pupils according to their abilities and conduct any athletic competition within these homogeneous ability groupings.

The size and weight of individuals has been used as a factor in classifying pupils for competition in such sports as wrestling, boxing and football. It is obvious that weight equality in combative sports such as boxing and wrestling is essential for safe results along with equal skill and physical condition. For years the Ivy League colleges had a program in 150 lb football in which the incidence of accidents and injuries was low. It might be feasible for those charged with the responsibility for conducting football programs to give consideration to some weight equality between teams.

An important factor in achieving safety in sports is the physical condition of the individual participating. Physical conditioning helps to protect the body by increasing the resistance to fatigue and by building strength, ability, and endurance. A pupil's physical condition should be consistent with the demands of the activity in which he or she wishes to participate. Therefore, physical condition should be used as a basis for classifying pupils before permitting participation in many activities.

Proper Conduct of Activities.

In order for activities to be conducted with a minimum risk of accidental injury, persons responsible for the conduct of these activities must educate the participants, provide proper and continuing supervision, and control the environment. These criteria apply whether or not the activities are conducted on the class, intramural, interschool or recreational level. However, because of the advanced level of play, the frequent intensity of competition and the presence of over-emphasis, it is particularly important that these approaches be followed in interschool competition.

The education of the sports participant involves a number of important considerations. One of the most important of these is the development of a level of skill which is consistent with the intensity and duration of participation. In skills development the teacher or coach must be concerned with such factors as the nature of the activity, the physical readiness of the individual for participation, the utilization of motor learning principles in teaching and coaching and the regulation of practice with respect to duration and intensity. From a knowledge standpoint, the participant must be made aware of hazards associated with the activity being engaged in, the consequences of unsafe acts or conditions, an in-depth understanding of an activity including rules and regulations, as well as a full understanding of conditioning and training procedures necessary for readying the body parts and body systems for activity. Medically, the participant should be cognizant of the necessity for a complete health examination, prior to athletic participation, to determine physical readiness for such participation. The specific conditions of the activity such as degree of contact, endurance, strength, joint flexibility, etc., should be taken into account. During participation there should be an understanding of the need for continuous health-status appraisal of sports participants. The coach or teacher should be alert to signs and symptoms that indicate unusual responses to the demands of physical activity. Following injury, illness or surgery, a referral health examination is essential before an individual returns to physical activity and sports participation. Finally, from a medical standpoint, the use of a physician to supervise the medical aspects of a school sports program provides for most effective participant safety control. This would include a plan for emergency care and first aid for all sports-related injuries or illnesses.

The provision of proper and continuing supervision of athletics and other physical activities at the instructional, recreational, intramural and interschool level becomes an effective control for minimizing the risk of accidental injury. Both qualitative as well as quantitative considera-

tions need to be understood for maximum supervisory effectiveness. Qualitatively, the teacher or coach who is supervising an activity should be a fully trained individual in that activity. This implies someone who has had experience in the form of participation as well as teaching or coaching and has a demonstrated competency as indicated by past performance. Presently, minimum certification for coaches in interscholastic sports programs is being effected as a requirement in various states. Quantitatively, there should be a sufficient number of teachers or coaches for the activity that is being conducted. Frequently, activities that are being carried on in recreational or instructional setting, have a student-teacher ratio that is far too great for effective supervision. With regard to reducing accidents and resulting injuries in sports and other physical education activities, the following are specific supervisory considerations to which a teacher or coach should be alert:

1. Have all participants adhere to sports rules as well as other regulations that insure safe conduct of an activity.
2. Be certain that all participants have medical clearance before engaging in any physical activity. This also applies to an individual returning to a physical education class, an intramural or recreational activity, and an interscholastic or intercollegiate team following illness or injury.
3. See that personal wearing apparel, including protective equipment is provided, fitted correctly and worn at all times during practice or play.
4. Make sure that the length and number of practice periods for a sport are carefully controlled. Particular attention should be given to such influencing factors as the strenuousness of the sport, fatigue, climatic conditions such as extreme heat or cold *etc.*
5. Work out a progressive conditioning schedule that is specific to the sport and see that each individual adheres to that schedule.
6. See that all activity skills are thoroughly and meticulously taught. Particular attention should be given to skills where the greatest incidence and severity of injuries occur such as tackling in football, sliding in baseball, dismounting or landing in gymnastics, *etc.*

In addition to educating the participant and providing proper supervision the third approach to the safe conduct of sports activities is the ability to control the environment in which they take place. This environment includes the activity areas both indoor and outdoor, the service facilities, including locker, shower and training rooms and the countless items of personal, protective and activity equipment. In order to control the injury problem that is attributed to insufficient, improper or faulty equipment and facilities, the following guidelines need to be followed.

1. The provision for the best available equipment and facilities as determined by available standards, or in their absence, upon the recommendation of those who are experienced in the use of various kinds of sports equipment and facilities. Presently, the F-8 Committee on Sports Equipment and Facilities of the American Society for Testing and Materials (ASTM) is in the process of developing valid standards for the football helmets, playing surfaces, the trampoline, for ski apparatus, for eye and face protection in ice hockey, to name a few. These standards, when adopted, will provide a measure of protection to the sports participant that is presently sorely lacking.
2. The development of a system of inspecting, testing and corrective maintenance of sports equipment and facilities on a periodic basis is essential. With regard to sports seasons this procedure should take place prior to the opening of such a season and also at the close of the season so that equipment may be cleaned and repaired and orders placed for the following year. For instructional and recreational programs the individual instructor or supervisor needs to follow the same procedure at the beginning of a senester or a sports unit. It is further recommended that teachers, coaches and supervisors make a practice of checking equipment at the time of use.
3. The provision for storage space for all sport and physical education equipment and

movable apparatus. This procedure is a desirable one from the standpoint of safety because it prevents use of such equipment and apparatus without designated supervision. Further, equipment is maintained better when it is stored in a designated space; first because it is possible to store according to manufacturer's specifications and secondly because it is removed completely from unauthorized use and possible harm.

SPORT MODIFICATIONS AND SAFETY

Standard sports rules are frequently modified to offer more meaningful activity programs, *e.g.*, to accommodate involvement of handicapped persons or groups; to overcome limited equipment or inadequate facilities available for a program; and to create a new twist for the sake of fun.

Evaluation of the influence of change requires more than casual attention. Preplanning for suitable modification is fundamental. Will it provide the motivation and challenge of that sport without introducing a new significant hazard or negating a previously effective injury control? Continuous evaluation along these lines should follow to detect unexpected patterns of accidental injury.

Such modifications are often made to bring the benefits of suitable sports experiences to all who could not benefit without them. Wheelchair sports as therapy for the physically handicapped and a portable swimming pool program for the inner city neighborhoods are examples. Under these circumstances, risks must be accepted in order that the benefits can be realized. However, these risks should always be calculated risks consistent with the philosophy of sports programs. Some control must be assured without voluting unnecessarily the potential value of the sports experiences.

To determine the amount and type of control often requires consultation with authorities experienced with the problem that produced the need for modification. By authorities we refer to: (a) the physician of the atypical person if a medical perscription for the modified activity is required; (b) physician consultation on the medical considerations involved when the needs of a particular atypical group are to be met through physical recreation; and/or (c) the consultation of educators who have studied and experienced modification of a sport for a particular purpose and who have arrived at what they feel is a good balance between sports benefits and sports risks.

GENERAL SAFETY CONSIDERATIONS

Because of the high toll of accidents on streets and highways, careful thought must be given to the manner in which athletic teams are transported. This includes any type of travel even if it is only to and from a practice field. Student athletes often ride with other students or with the coach with minimum consideration to driver qualification, vehicle condition and load, driving conditions, and adequate insurance. This practice is fraught with potential dangers because the driver may be reckless, the vehicle defective, and driving conditions hazardous.

The more desirable method of transporting athletic teams is by school bus or public carrier because of the presence of important safety factors such as a more qualified and experienced driver, a safer and better maintained vehicle, and more adequate insurance coverage.

If a private auto is used, care should be taken to: a) select an accident free, responsible adult driver; b) select a vehicle that has been inspected and approved; c) obtain adequate insurance coverage; d) secure approval of school authorities; e) have parent consent; and f) cancel trips when driving conditions are hazardous.

Because of the unusual circumstances associated with sports participation such as showering, dressing, and being in the swimming pool, the necessity for carefully planned, organized, and frequently practiced emergency drills, including fire drills, is very great. A clothing procedure for the gym, pool, locker and shower room, and special activity rooms should be

worked out. If the weather is favorable, students in the gym and special activity rooms can carry out the drills in their gym outfits. If the weather is inclement and time permits, they should be permitted to secure outer clothing. If it is an actual fire and danger is imminent, safety precedes comfort.

For students in the pool, shower, or locker room who are scantily clad, a procedure for quickly securing clothing should be worked out and practiced during the drills. Again, if an actual fire is in progress and danger is imminent, safety precedes modesty.

Each physical education teacher should carry a roll book so that when the class reaches its assigned area, roll can be taken to assure that all students are accounted for. This can be done quickly with a prearranged buddy system.

In addition to developing an efficient drill procedure, the physical education deparmtent should consider other fire prevention practices:

1. Make sure all exit doors from the gymnasium, locker room, special activity rooms, and the pool are unlocked and in working order.
2. Know the location and operation of fire extinguishers.
3. Post fire drill regulations in conspicuous places.
4. Use metal storage cabinets for hazardous items such as paint, turpentine, and acids.
5. Make sure all passages and aisles used to vacate the premises are always kept clear.
6. See that exit lights in the gymnasium are on at all times.
7. Do not permit accumulation of rubbish, junk, and other waste materials.

The use of the indoor physical education plant for activities where spectators are present requires certain precautions. One of the most important considerations at any time is the danger of fire. Fire prevention rules must be strictly enforced during the use of indoor spectator areas. Smoking, overloaded premises, insufficient or locked exit doors, and poorly marked exits increase the potential for disaster if a fire occurs.

The use of trained guards is desirable for maintaining order in case of trouble and to restrain spectators from the play area. Ushers might also be an added safety factor by facilitating the movement of persons to and from their seats.

Schools frequently enlist the assistance of the local police department to facilitate the movement of traffic to and from the games. Events also run smoother and safer when parking space is provided and teachers and/or students are used to help.

If there are beverage vendors at these events, all drinks should be dispensed in paper cups instead of bottles or cans.

By carefully analyzing the situation in each school, it is possible to adequately prepare for emergency, situations which can be handled in such a manner that a disaster may be averted.

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Chapter 5

THE HEALTH EXAMINATION

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The term *health examination* has replaced *physical examination* in signifying the physician's appraisal of a student's medical eligibility for sports and other school activities. *Physical exam* has had a limited meaning. To many, it was considered a threat to participation. To others it connoted a required ritual of recording physical test findings that would satisfy any legal inquiry into the school's efforts to prevent students with atypical physical conditions from engaging in school sponsored programs.

Conversely, *health examination* has a positive connotation and suggests a student's qualification for safe participation in a suitable activity. The aims of the health examination are listed in the *AMA's Guide for Medical Evaluation of Candidates for School Sports:*

1. Determine the health status of candidates prior to participation and competition;
2. Provide appropriate medical advice to promote optimum health and fitness;
3. Arrange for further evaluation and prompt treatment of remediable conditions;
4. Counsel the atypical candidate as to the sports or modification of sports which for him would provide suitable activity;
5. Restrict from participation those whose physical limitations present undue risk.

The *health examination* is considered the priority item for the welfare of candidates for sports. Is the student capable of strenuous, all-out-effort? Is he or she especially vulnerable to the risks inherent in a given sport? Participation in sports involves a calculated risk, and it is the purpose of the health examination to help minimize *undue* risk.

Types of Health Examination

The health examination is of two types: the *periodic* health examination which is predictable (one can predict when it will occur), and the *referral* health examination which is unpredictable (it occurs when a need is recognized). A total health appraisal should be organized; this combines the information derived from periodic health examinations and teacher observations and, where indicated, with the consequences of referral examinations.

Discussion of periodic health examinations for sports must encompass the school's total health and safety program since the sports program is an extension of the entire school educational curriculum.

The periodic health examination of school age boys and girls generally occurs a minimum of four times in a student's precollege career:

1. As the student enters school at kindergarten or primary level;
2. At the fourth grade or intermediate level;

3. At the seventh grade or junior high level;
4. At the tenth grade or senior high level. (5:15)

Beyond this index of the students' health are the skilled observations by teachers of the children they see day to day over months at a time. Any deviation from the student's norm would be evaluated by a referral exam to see if:

1. The student has an underlying illness;
2. The student has not been practicing sound health habits;
3. The student has not budgeted his time wisely; or
4. A teacher, parent, and/or employer have been making undue demands on him.

The regulations of the school system, state laws and the demands or hazards of certain sports are of sufficient significance beyond the scope of the customary health appraisal to justify selective use of the periodic health examination for sports.

The following list shows what one county medical society found while cooperating with the local school systems for preseason school athletic exams. Of 1,107 exams in doctors' offices, the society discovered: one congenital heart leading to surgery, two rheumatic hearts which restricted activity, six boys with only one functioning eye, one chronic genitourinary infection, three with one testicle, one kidney anomaly with hypertension, one diabetic, two hernias, one spondylolysis, two weak knee ligaments, one epileptic, and numerous lesser problems (7).

Totals of one and two do not seem impressive statistically until one considers a national summarization of all county experiences. Conditions such as having one testicle or being an epileptic under medical control pose little problem for the student seated in the classroom. However, place this same student amid colliding bodies in a sports activity and these conditions become potentially significant.

Scope

Knowledge of past illnesses, injuries, operations, and immunizations is necessary to ensure proper medical evaluation of a student's health. The *AMA Guide* suggests that the candidate's personal physician carry out the health examination since he already is familiar with the student's health history. If there is no personal physician to consult, a health history form should be completed by the candidate and parents and made available to the examining physician. A suggested form, developed by the American Medical Association Committee on the Medical Aspects of Sports, appears in Table 1 (2:5).

In some communities, athletes are examined individually by their family physician, school physician, or team physician. In other communities, a group procedure is utilized. The particular method of handling the examinations depends upon the customary procedures, leadership, and resources of that community. Generally, problems can be worked out satisfactorily through the school health committee of the local medical society in conjunction with appropriate school personnel. The following considerations are basic to any arrangement:

1. Ample space in a private, quiet room with no demands for undue haste;
2. Examinations scheduled sufficiently in advance of the practice or conditioning program to allow adequate time for consultation, diagnosis, and treatment, when necessary;
3. Health evaluation extending from the sport in question to all sports available in the community.

Under these conditions, one thorough annual health examination for sports would be sufficient for the student. However, there are exceptions to this rule for the candidate who after the annual examination and before the onset of a new sport within the year: (a) experiences a significant injury or illness; (b) undergoes surgery and/or therapy; or (c) is not under direct observation by the physical education faculty of that school for a significant period of time. Preference for an August health exam over an April-June exam for football candidates, for example, is based on the fact that these boys are not under the school's day-to-day observation during the summer.

Table I

SUGGESTED SPORTS CANDIDATES' QUESTIONNAIRE

(To be completed by parents or family physician)

Name _____ Birth Date _____

Home Address _____

Parents' Name _____ Tel. No. _____

1. Has had injuries requiring medical attention	Yes	No
2. Has had illness lasting more than a week	Yes	No
3. Is under a physician's care now	Yes	No
4. Takes medication now	Yes	No
5. Wears glasses		
contact lenses	Yes	No
6. Has had a surgical operation	Yes	No
7. Has been in hospital (except tonsillectomy)	Yes	No
8. Do you know of any reason why this individual should not participate in all sports?	Yes	No

Please explain any "yes" answers to above questions:

_____

_____

9. Has had complete poliomyelitis immunization by oral vaccine (Sabin)	Yes	No
10. Most recent tentanus toxoid immunization _____ (date)		
Was this a booster?	Yes	No
11. Has seen a dentist within the past 6 months.	Yes	No

_____

Parent or Physician

Disqualification

Some conditions observed in the routine examinations are not defined clearly or may have questionable significance. A heart condition on the record of a sports candidate is meaningless if not further evaluated. One cardiologist has listed eight types of heart conditions that could be diagnosed among youth, each with some subcategories of pathology. Yet such conditions are not necessarily contraindications for sports participation. Depending on the severity of the condition, the sport, and the boy's response to activity, physicians now have at their disposal a simple office method for assessing a candidate's response to endurance activity (1)

The AMA Committee on the Medical Aspects of Sports explains that for a student with a health disorder, the degree of danger in sports participation varies with the abnormality as it relates to risks, the otherwise athletic fitness of the candidate, and the nature of the supervisory control. There are three general aspects of sports to be considered when evaluating a student for safe participation: endurance, collision, and other (the noncollision, nonendurance sports). Approval for sports in one category is possible even though disqualification would be warranted in a different category. Disqualification does not necessarily imply restriction from all sports or from the sport in question in the future. (Note: a boy who is medically disqualified from a varsity sport must not be permitted to participate in the intramural version of that sport unless explicit approval is received from the disqualifying physician.)

A physician should be appointed to serve as team physician for the school's sports program -- varsity and intramural. This arrangement does not negate the role of the family physician. The title *team physician* denotes a physician who is vested by the school with authority to make medical judgments relating to the participation and supervision of students in school sports. Without such a categorical designation of responsibility, there cannot exist the continuing medical assistance the athlete deserves. To put the responsibility of on-site medical decisions on the shoulders of nonmedical personnel or physicians who are removed from the scene serves no one effectively." (3:498-501)

One distinct advantage of having a team physician is uniform interpretation of health examination findings. Through close and constant contact with the athletes, the physician can acquire diagnostic insights that might complement the general health exam. Candidates for football, for example, could undergo special tests that would reveal knee stability or thigh muscular strength. Also, a team physician learns the capabilities of the supervisory controls, the resources available for his coordination, and the degree of risk associated with a sport.

Continuous Appraisal

Periodic health examinations in a sports program identify candidates with health problems who should receive special consideration. The *AMA Guide for Medical Evaluation of Candidates for School Sports* contains a "Suggested Health Examination Form" which was developed in conjunction with the National Federation of State High School Associations. An example of these forms appears in Table 2.

Even on an annual basis, however, health examinations cannot uncover every condition that may develop as a result of the stresses of participation. The athletic trainer or, if none is available, the coach-physical educator, with his background in the basic health sciences and because of frequent and repeated contact with his group of athletes, is in a strategic position to observe any unusual responses of the participants to the demands of the sport and training program. The coach, however, should not become so absorbed with the skills he is teaching and the progress certain athletes are making that he neglects his responsibility to recognize conditions that merit referral for medical evaluation and diagnosis.

Reactions which may not be indicative of a health problem, but do demand medical review include excessive breathlessness, bluing of the lips, pale or clammy skin, unusual fatigue, persistent shakiness, and muscle twitching or tetany.

TABLE 2
SUGGESTED HEALTH EXAMINATION FORM

Cooperatively prepared by the National Federation of State High School Athletic Associations and the Committee on Medical Aspects of Sports of the American Medical Association.) Health examination for athletes should be rendered after August 1 preceding school year concerned.

(Please Print) Name of Student City and School

Grade _____ Age _____ Height _____ Weight _____ Blood Pressure _____

Significant Past Illness or Injury _____

Eyes _____ R 20/ ; L 20/ Ears _____ Hearing R /15; L /15

Respiratory _____

Cardiovascular _____

Liver _____ Spleen _____ Hernia _____

Musculoskeletal _____ Skin _____

Neurological _____ Genitalia _____

Laboratory: Urinalysis _____ Other: _____

Comments _____

Completed Immunizations: Polio _____ Tetanus _____

Date Date

Instructions for use of card Other _____

"I certify that I have on this date examined this student and that, on the basis of the examination requested by the school authorities and the student's medical history as furnished to me, I have found no reason which would make it medically inadvisable for this student to compete in supervised athletic activities, EXCEPT THOSE CROSSED OUT BELOW."

BASEBALL	FOOTBALL	ROWING	SOFTBALL	TRACK
BASKETBALL	HOCKEY	SKATING	SPEEDBALL	VOLLEYBALL
CROSS COUNTRY	GOLF	SKIING	SWIMMING	*WRESTLING
FIELD HOCKEY	GYMNASTICS	SOCCER	TENNIS	OTHERS _____

Estimated desirable weight level: _____ pounds.

Date of Examination: _____ Signed: _____

Examining Physician

Physician's Address _____ Telephone _____

STUDENT PARTICIPATION AND PARENTAL APPROVAL FORM

Name of student: _____ Name of School: _____

First Last Middle Initial

Date: _____ Date of Birth: _____ Place of Birth: _____

This application to compete in interscholastic athletics for the above high school is entirely voluntary on my part and is made with the understanding that I have not violated any of the eligibility rules and regulations of the State Association.

Instructions for use of card Signature of Student: _____

PARENT'S OR GUARDIAN'S PERMISSION

I hereby give my consent for the above named student (1) to represent his school in athletic activities, except those crossed out on this form by the examining physician, provided that such athletic activities are approved by the State Association; (2) to accompany any school team of which he is a member on any of its local or out-of-town trips. I authorize the school to obtain, through a physician of its own choice, any emergency medical care that may become reasonably necessary for the student in the course of such athletic activities or such travel. I also agree not to hold the school or anyone acting in its behalf responsible for any injury occurring to the above named student in the course of such athletic activities or such travel."

Signature of Parent or Guardian _____

Date: _____ Address: _____

(Street) (City or Town)

NOTE: This form is to be filled out completely and filed in the office of the high school principal or superintendent of schools before student is allowed to practice and/or compete.

A number of other complaints associated with the demands of sports may be cause for a referral exam. According to the AMA Committee, recurring or persisting patterns of any of the following, particularly when related to activity, require medical review: headache, dizziness, fainting, interrupted night's sleep, digestive upset, pain unrelated to injury, undue pounding or uneven heartbeat, and disorientation or personality changes.

Legal Considerations

Schools and agencies sponsoring activity programs should require, for the protection of the athlete as well as the program, written certifications from physician and parent permitting the student to participate. Three major considerations affect the legal status of these certifications for participation.

First, no guarantee of safe participation should be implied because, simply, no guarantee can be made. Protective measures in sports are to make participation safer, but these measures cannot be expected to guarantee safety at all times.

Second, no parent can waive the legal rights of the minor child. When that child reaches legal age, the previous releases of liability are voidable.

Third, the determination of negligence of a professional person is based primarily on an interpretation as to whether he has conformed to the standards of prudent professional behavior in that community under the given circumstances. For an institution, negligence would have broader implications. In this regard, Leibee lists four elements of negligence used by the courts as criteria: "(1) Duty to conform to a standard of behavior which will not subject others to an unreasonable risk of injury; (2) Breach of that duty — failure to exercise due care; (3) A sufficiently causal connection between the conduct or behavior and the resulting injury; (4) Damage or injury resulting to the rights or interests of another." (6:8-9). Mere carelessness is not the extent of the law's consideration of negligence.

A physician's examination and consequent certification is now considered a fundamental procedure in the protection of students wishing to engage in school or community sponsored sports programs. The risk of legal liability for a physician who undertakes the medical examination, supervision, and care of members of a school athletic team parallels that of a physician in any other type of practice (4). In fact, very few suits arise out of the medical supervision of school athletic teams or the treatment of injured student athletes at the scene of the injury.

Parental consent for a child's participation and for emergency medical care makes it clear that the sponsoring institution's designated physician is executing an appropriate function in handling on-site athletic injuries. While the minor's right cannot legally be waived, such a release reflects the honorable intent of the school and physician in protecting the athlete and deters unwarranted future suits.

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Chapter 6

LEADERSHIP CONTROLS

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There is a crisis in education today. Questions relative to traditional patterns of instruction where the questionable "tried and true" has been the dominating force, the empirical approach of "trial and error", and the creative approach where the hope for "new discoveries" will make for more efficient learning, have given cause for much confusion in terms of directions education should take. Curriculum planners find themselves in a constant flux of change. These patterns of course are understandable because we do live in an ever-changing society.

The need for individual adjustment to change in the complexities of forces operating on all mankind certainly gives rise for as many kinds of inputs as possible from all sources available, to help all concerned to reap a more pleasurable and happy life.

Teachers, specialists, and administrators must seek out all possible avenues in order to make students receptive to "change" — especially to those things that have relevance and meaning to life's demands. Our nation is built on one's desire to accept challenges, to test self, to be competitive, and to stand out among peers. These factors are the basic elements in sport.

Sport has come a long way toward becoming an intricate aspect of North American life. Readers are invited to read the recent work edited by Earle Zeigler.(8) We now know that in any highly popular and fastly growing development, such as sport, concurrent problems also arise. Inherent in all activities and movement are certain risks. Persons, by nature of their own behavior, take on additional risk involvement. How individuals relate to their personal selves, the environment, and to created objects makes it more important to bring good judgement and sound knowledge into a sensible sphere of understanding whereby mankind can relate best to an existence in the world of things in a safe and orderly manner.

All sport activities are not adaptable to all people even though mass-media, high powered salesmanship, individual false concepts of self, and the American thrust for fads seem to negate this point. "I'm the greatest" certainly is not an idle saying. We pay a high cost in human life and limb for all the advancements made because of economic benefits, medical and technological breakthroughs, and education. This is so because of man's inability to make wise use of the things made available for his benefits.

While one should be encouraged by the attention given to the manufacture of safe equipment, the important work being done by public health and medical professionals, the American School and Community Safety Association, and other organizations whose primary objective is safety, more individual and group involvement is demanded.

There is a growing need for good leadership in sport programs. While such programs offer worthwhile benefits they often pose significant risks to the well-being of the participant. Sound

leadership must be exercised to plan and administer safety measures to preserve both the integrity of the activity and the health of the participant.

Advanced planning of a sport program in terms of leadership control should include anticipation of certain hazards related to sport activity, facilities, environment, participants, supervisory personnel, and the attitudes of the community. Consideration should also be devoted to the development of guidelines, establishment of a philosophy and objectives, determination of content, analysis of student experiences, and the means whereby standards for evaluation can be established and utilized. In addition, leadership control directs the implementation of ideas, the application of principles to the current situation, and the exercise of vigilance during on-site supervision.

Leadership control includes recognition of the need for improvement in techniques of safety instruction. It also recognizes the role that other professionals and agencies play in the field of safety education. Thus, there should be mutual assistance in providing laboratory experiences, establishing the best plans for teaching, stimulating proper motivation for learning, and assuring safety measures which will reflect the best educational practices.

Leadership control involves the kind of teaching that imbues the participant with a respect for the principles of safety. The safety-educated participant of today will be an effective safety leader of tomorrow.

SELECTIONS AND TRAINING OF TEACHER-LEADERS

In *Toward Excellence in College Teaching* it is noted that "Society . . . desperately demands a great number of devoted and dedicated persons who can utilize not only the best of accumulated knowledge of the past but also stimulate the search for new discovery and knowledge." (5:4) Although the primary thrust of this work is directed to the college teaching, its implications can be directed to all teachers at all levels of learning.

In addition, teachers of safety should: have in-depth knowledge of the technical features of design and use of sport equipment; have a thorough understanding of human behavior and how such behavior is regulated by emotional conditions and the environment; possess a willingness to accept innovations and new concepts as identified by research and technical developments; acquire the best available information; and steadfastly maintain flexibility in adjustment to the tenor of the time. Naturally, it is assumed that the arts and skills of teaching have been mastered.

Improvement in course offerings in our schools is needed in the area of safety. In many of our teacher training institutions, courses in safety, if offered at all, are offered primarily on an elective basis. Our colleges have an important role to play in this regard — to develop a pre-service program that will assure competency in teaching safety. Government also has a responsibility here and it is exercised by state departments of education.

State departments of education can help significantly by instituting and updating certification requirements to make safety instruction mandatory from nursery through the university.

Strict policies should be developed relative to the hiring practices of local boards of education. A common example of improper hiring can be noted in the selection of some coaches. At times coaches are employed who have little or no training in safety education procedures, the prevention and care of athletic injuries, anatomy and kinesiology and related subjects. This practice also exists in the hiring of personnel for playground and neighborhood recreation programs in many communities. Often these conditions result from political patronage where little or no interest for safety is noted. Yet, the shortages of sufficient funds and qualified safety leaders have done much to create this deplorable situation. Fortunately, many communities have access to agencies such as the American Red Cross, state, county, and local health centers, industrial concerns, first aid volunteers, doctors, nurses, community colleges and universities, and other specialized and service organizations which might be called upon to assist in the training of personnel in safety procedures.

The training of staff must take on paramount importance if educational growth and responsibility is to be developed in youth. Staff personnel must be made keenly aware of their role in the total scheme of education in its fullest meaning and stand ready to improvise, create, and develop the best kind of learning atmosphere possible.

Leadership control has its basic roots in knowledges learned and assimilated into one's life-style. The broader the experiences and knowledge possessed by the teacher-leader in the various aspects of human behavior, environmental health, and sport participation, the better these persons will be prepared to institute courses of safety instruction and relevant practical experiences. To this point, Read and Greene write, "Safety needs are almost as important as are physiological needs, especially at an early age. These safety needs include freedom from injury and threatening situations, as well as a feeling of security from life's major hazards. The teacher-leader can help the student to achieve these needs through the promotion of safety education." (6:30)

STAFF SELECTION

Selection of personnel not only includes certain specialized training but the placing of the right person in a job. Schools would do well to use job analysis prodcedures as practiced in industry.

The selection of staff to supervise and direct instructional programs should be made with special care. Academic training and background should be comparable to that of other members of the instructional staff. The teacher-leader's capabilities should be demonstrated not only by academic and scholastic achievement — although very important — but also by their adaptability in meeting varying situations. A pleasing personality and high moral caliber are likewise important factors to consider in the selecting of leaders.

How well a program succeeds depends upon student response. This response is largely determined by the actions of the leader. The way in which the teacher-leaders present themselves, their understanding and interest in students, and their knowledge of subject matter may well be the dominant factors of the safety education program.

IN-SERVICE TRAINING

Safety education is not specifically the domain of a few, but involves all personnel who have contact with students. Therefore, strong programs of in-service training are a constant need. It goes without saying that when the teacher-leader shares the planning with the staff, cooperation is heightened and creativity looms beyond usual expectations. A good example of cooperative input is reflected in the work done by the Kokomo Center Township Consolidated School Corporation in their development of a comprehensive driver and traffic safety multi-media program. (1)

Inasmuch as this publication is concerned with sport safety, it is most important that the protection of the health of participants be given prime consideration. It is a shame to observe the dangerous predicaments that many athletes are placed into by coaches. Also, the untrained coach must upgrade his education through attendance at workshops, conferences, and professional meetings.

Safety education is a continuous process. Well organized in-service safety training programs are essential for the development of competent school personnel. In-service training may range from simple activities of reading and discussion to university work.

SUPPORTING SERVICES

In a school setting, the teacher-leader must have the full cooperation of colleagues, support staff and the administration. The administration can assist by:

1. employing staff whose training and experience is of the highest caliber.

2. providing leadership and support in the development of instructional guidelines.
3. being available to interpret the safety program as it relates to the total instructional program.
4. providing avenues for guidance and counseling when needed by the professional staff.
5. providing the means for determining community needs.
6. providing scheduled time for workers in the safety programs to do research, to discuss research data presented by others, and to attend professional meetings, conferences and lectures.
7. utilizing the services of agencies in the safety area and maintaining a close relationsip with them.
8. making available adequate financing to carry on the safety program.
9. maintaining an interest in the safety program and developing safety problems.
10. providing the means for determining the best utilization of school personnel in meeting the needs for a sound safety program.

INSTRUCTIONAL STAFF

The instructional staff can assist the leader of the safety program by:

1. implementing safety policies and serving on committees.
2. incorporating safety information into their own areas of specialization.
3. teaching safety whenever the opportunity is presented.
4. Participating actively in organizations, such as PTA, scouting, and civic groups.

CLERICAL, MAINTENANCE, AND CUSTODIAL PERSONNEL

The clerical, maintenance, and custodial personnel can play a vital role in the area of supplementary safety instruction by:

1. providing the necessary care and maintenance of a safe environment.
2. providing specific and authorized controls when faculty personnel are not on the scene.
3. exercising good reporting practices whenever equipment and facilities appear potentially dangerous.
4. fully supporting the safety program.

TEACHING TECHNIQUES

Much has been written relating to those components and qualities that make for good teaching.

1. A good teacher is a good person. Simple and true. A good teacher likes life, is reasonably at peace with himself, has a sense of humor, and enjoys other people. If I interpret the research correctly, what it says is that there is no one best better-than-all-others type of teacher. Nonetheless there are clearly distinguishable "good" and "poor" teachers. Among other things, a good teacher is good because he does not seem to be dominated by a narcissistic self which demands a spot light, or a neurotic need for power and authority, or a host of anxieties and tremblings which reduce him from the master of his class to its mechanic. (2:38)

2. The good teacher is flexible. By far the single most repeated adjective used to describe good teachers is "flexibility." Either implicitly or explicitly (most often the latter), this characteristic emerges time and again over all others when good teaching is discussed in the research. In other words, the good teacher does not seem to be overwhelmed by a single point of view or approach to the point of intellectual myopia. A good teacher knows that he cannot be just one sort of person and use just one kind of approach if he intends to meet the multiple needs of his students. Good teachers are, in a sense, "total" teachers That is, they seem able to be what they have to be to meet the demands of the moment. They seem able to move with shifting

tides of their own needs, the student's, and do what has to be done to handle the situation. A total teacher can be firm when necessary (say "no" and mean it) or permissive (say "why not try it your way?" and mean that, too) when appropriate. It depends on many things, and a good teacher seems to know the difference. (2:39)

A teacher cannot be all things to all students. Yet, a teacher in such a critical area as safety education must strive to become as human and efficient as possible.

PHILOSOPHY AND OBJECTIVES

A philosophy or statement of principles relative to the purposes, beliefs, and values of a safety program should be established. Because of the tremendous impact and importance this statement has on that which follows with respect to structure, policies, standards, management, content, and evaluation, the best kind of professional safety counsel and advice available must be sought. This does not mean that only persons with a specialization in safety must be consulted but the experience of students, maintenance workers, and others involved with safety programs should be fully utilized.

The philosophy or statement of principles must reflect careful thorough, study and imagination. It should provide the administration and all other persons directly or remotely concerned with safety a thorough understanding of the realm of those things that are pertinent to the subject and activities to be developed.

The teacher-leader soon learns that program management, cannot be an isolated individual affair. Cooperation can best be acquired through the process of good planning, completeness in organizational structure, honesty and integrity (misleading concepts and unrealistic and lofty ideals have no place in the designs for leadership controls).

Objectives should be clear, to the point and based on need and obtainable goals. They should clearly lead to the desired behavioral changes implicitly or explicitly desired for the participant and should lend much toward continued opportunities for evaluation. Whether the objectives are immediate or long range, supporting evidence must be factual and practical. All units of instruction and management should be specific and the participant should have a clear idea of what he is to expect and what should be expected of him.

DETERMINING NEEDS

Participants in sports activities reflect a variety of experiences. The teacher-leader must be conscious of these varieties and take nothing for granted. Teachers of sport should take into account the many motivating influences that affect participants and play an important role in the individual's behavioral reactions under stress. The desire to satisfy the teacher-leader in order to make a squad, get approval from peers, parents and fans, and satisfy inner needs are factors that might cause reckless behavior and the abandonment of self-protection.

Wide use of data presented in research studies and reports pertaining to mortality and morbidity rates resulting from sport injuries should be made. Although some teacher-leaders may have second thoughts about the use of accident reports and in many instances, refrain from keeping records themselves for fear of later repercussions, this action perhaps ranks as one of the best ways to analyze the multiplicity of hazards inherent in all aspects of activity.

A record of every accident resulting in the slightest injury should he maintained. All relevant factors and conditions should be recorded. Evidence of this nature can provide clues to possible accident hazards.

Further suggestions for determining interests and safety needs of individuals include discussions, observations, inventories, socio-drama, conferences with students and parents, checklists, student questions, environmental conditions, in-depth study of accident data relative to injury and death, and contributions emitting from various authorities. This list is by no means complete. It should be understood that additional factors may affect methods used in determin-

ing an individual's needs. Some examples are the age of the individual, previous experiences, geographical location, education, and socio-economic background.

The teacher-leader must take into account various avenues available to him which will enable participants to gain appreciations and insights, make decisions and develop a keen sense of values. An appreciation of good positive values will add much to how an individual behaves in situations where the taking of risks may lead to serious injury or death. One's personal character and the ability in self-discipline regarding the adherence to rules and fair play are the positive outgrowth of the teacher-leader's role in the total scheme of safety education.

MOTIVATION

The teaching and learning climate involves a partnership between the teacher-leader as the producer and the learner-participant as the consumer. The teacher-leader should recognize that the learner-participants are individuals and their interests, attitudes, purposes, responses, and experiences vary. The teacher leader must be able to identify differences and act accordingly.

The teacher-leader must take into account several factors such as needs, age levels, interest patterns, and the abilities of learner-participants to comprehend information and experiences. In other words, leadership-controls must be geared to the achievement level of the learner-participant.

There are many contradictions regarding motivation. The "best way" or "another way" to get the best results economically from leadership is a question to be answered only in a specific skill of the teacher-leader. How well the planning, implementation, and evaluation are done will certainly provide the teacher-leader with the kinds of insight needed for self-improvement.

INNOVATIONS AND CREATIVITY

Effective *leadership controls* demand the acceptance of challenges and continuing efforts on the part of the teacher-leader to get the best possible results from the amount of input required in a specific situation. Is there a better way? Such a question is a constant reminder that skill in leadership is an art. This art results from one's desire and ability to master. Recognizing that all persons involved in areas of responsibility are not expected to be innovators does not preclude continuing efforts and insight needed to improve the accomplishments of the task at hand and reap the best results.

The teacher-leader must be a team person who is able to exact the best. Torrance writes "teachers generally have insisted that it is more economical to learn by authority. It now seems that many important things, though not all, can be learned more effectively and economically in creative ways rather than by authority." (7:1) Jackson and Messick add support by writing that "the ultimate concern . . . . is the human mind and its inventions. Although there are many ways to describe man's mental complexity — and particularly to depict his cognitive strengths — the two terms 'intelligence' and 'creativity' seem to have the greatest summary power." (3:1) How wonderful it is to see children learning in a "child's world" and doing creative things consistent with their age and growth. On the other hand, one can watch eight-or-nine-year-olds playing tackle football. This situation is of concern to the leadership in so many of our sport activities where there is high injury risk. Alternative approaches add zest and excitement to participation and become appealing to the teacher-leaders once they have accustomed themselves by eliciting the learners' own judgment and reactions.

TEACHER-LEADER READINESS

Materials presented in courses of instruction should be selected on the basis of timeliness and appropriateness to objectives. Before the full value of materials can be appreciated however, teachers should know about the psychological factors that affect learning. Teachers should ask

the following questions. Are my students emotionally and psychologically ready for the material to be presented? Have I properly prepared them so that they can master the work and find value in it? Am I fully aware of the individual differences that are present in the group? Is the curriculum geared to student's age and maturity? Do my students have the necessary background to understand fully the information to be presented? Have I arranged the material and accompanying experiences so that students can readily relate school work to their experiences? Can relationships to existing environmental situations be made? Is the vocabulary employed geared to the level of student? Have I assured myself that the curricular area is really worth teaching? Has my selection of material been made on the basis of priority and does it represent the best available: Does this phase of instruction relate to past or future phases of course offerings?

To the list of question many others can be added that would significantly aid the teacher's self-direction and orientation the complex role of teacher-leader.

ENVIRONMENTAL CONSIDERATIONS

Wise use of the environment — its conservation and improvement — should be continually stressed in the teaching and management of areas particularly adapted to sport activities.

Land and water usages play an important role in many activities enjoyed by millions of people today. How long will our hills and streams be available for trail riding, skiing, fishing, hunting, snowmobiling and countless other activities for future generations to come? The good teacher-leader is an environmentalist in the truest sense. The teacher-leader should recognize that land and water areas lend much in the way of hazards. Therefore, the curriculum should include the appreciation and respect for the dangers that exist. Mankind must be taught to live with nature and respect it as part of his own human development. In this aspect, leadership controls take on meaningfulness that will be everlasting.

LABORATORY EXPERIENCES

Safety instruction and accident control must be geared to practical and realistic situations. Too often instruction ends in the classroom rather than carrying over into the activity environment.

If safety features are to be learned then student-participants must have the opportunity to apply what they learn. Training programs should be devised to give student-participants needed safety experiences under competent adult supervision. The design of such laboratory training programs should not place them in any danger but should provide a meaningful way of bringing into focus the various aspects of safety knowledge learned. The activities provided in these experiences should allow opportunities for the student-participant to make decisions, solve problems, rate himself and others, and to express freely his feelings about the experiences.

It is important that thorough planning and careful controls precede the actual movement of the student-participants. Poor planning and controls may lead to poor insight. Faulty habits and attitudes in addition might be developed and they could destroy the noteworthy intentions of the teacher-leader. The teacher-leader is reminded that the laboratory experiences are not to be used as "playtime" because these experiences may prove to be the most forceful and important part of the safety instruction program.

On-site supervision, careful hazard analysis of activities involved in athletics, physical education and recreation; hazards associated with facilities and equipment; opportunities for incidental teaching; and individual responsibility for safety of self and others are some of the many facets of laboratory experiences. Implementation must involve all groups and individuals concerned to insure coordination and understanding of the objectives to be accomplished. Knowledge gained should generate the kind of involvement that will carry over into other interests.

TEACHING AIDS

Teaching aids should be selected on the basis of their uniqueness and utility to teaching situations.

Aids that can be used to supplement the instructional program are:

1. audio-visual aids — movies, slides, films, loop films, television and video-tapes
2. bulletin, chalk, and magnetic boards
3. demonstrations
4. experiments
5. field trips
6. phonographs and tape recorders
7. reading materials — textbooks, articles, booklets, pamphlets, and catalogues
8. records
9. special aids — charts, diagrams, photographic materials
10. speakers and consultants

EVALUATION

Efficient methods of evaluation are essential to a successful program of safety education. The extent to which one learns and reaches desired objectives should be made known. Through good evaluation procedures the teacher-leader is provided with information that he can use to evaluate teaching and learning strategies as well as which alternatives might be selected, utilized, or discarded.

Evaluation can provide valuable insights concerning the strengths and weaknesses of a program. Too often data revealed from evaluation instruments are stored and never used. It is vitally important that persons concerned with the program, especially the student-participant, be the recipients of information regarding the program. There is much to be learned from system breakdowns and failure.

It is certainly expected that full consideration be given to the variety of evaluation devices now in existence. Yet it is known that all evaluation techniques present specific limitations. Teacher-leaders should be encouraged to devise their own techniques and procedures as well as make use of those that are available in the original form or with modifications.

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Chapter 7

FACILITIES, EQUIPMENT AND SUPPLIES

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Sports and recreational safety is an inherent objective in both the planning and engineering of buildings and grounds. Since safety is the quality or condition of being safe; freedom from danger, injury or damage; facilities, supplies and equipment can facilitate either an unsafe or a safe environment. The condition of being safe can revolve around several important considerations such as security, hygiene, control, and layout. Therefore, the planning of any areas to facilitate activities and the subsequent designing and engineering of such facilities should incorporate all such considerations.

PLANT PLANNING CONSIDERATIONS

A long range effort of extensive research and planning is basic to the orderly improvement and development of sports and other recreational facilities. New facilities are planned in terms of future curricular or service needs and resultant expanded programs to help insure maximum use.

A master plan for a facility should include, in addition to buildings, sites for out-of-doors sports and other forms of recreation or education. Community governments, school boards, park commissions, and other public service organizations working together with a community planner are essential to the establishment of a master plan for community growth.

With an acceptable master plan, construction of sports and other recreational facilities will follow an orderly and systematic schedule of development. Such a master plan generally will locate buildings and grounds for sports and other recreation.

Specific site selection is most important to participant safety. Considerations should include traffic use relationships and adjacencies, terrain orientation, access and other features. Those responsible for the administration and operation of the recreational facility should be represented in the task of selecting a site. Once a specific site has been selected, a building or facility committee should be formed which includes representatives from all groups planning to use the facility.

The first responsibility of this committee is to formulate a statement of purpose and philosophy to serve as a guide to those involved in planning. The program must be interpreted to the community as well as to the architect and others involved in facility construction.

One individual should be appointed as coordinator of the proposed facility. This person would act as a liaison among the administration, architect, and contractors and those involved in facility use. While it would be desirable if the coordinator had some experience in facility construction, it is essential that he be thoroughly familiar with the functional aspects of the programs to be offered. It is recommended that members of the planning committee visit

similar facilities to ascertain their advantages and disadvantages. They should not be used for exact duplication as each facility reflects its own activities.

Responsibility for the preparation of an "Ed Spec" or program specification for the proposed facility falls into the hands of the planning committee. Recommendations on type of activity, suggested number of stations and their size, and other special considerations are developed by the planning committee for preliminary discussions with an educational or recreational consultant. Functional-spatial relationships must be interpreted before the development of preliminary drawings by the designer who is a licensed professional.

The general design and engineering of a building or a sports facility is the responsibility of the architect or landscape architect. Since the planning committee represents those who pay for, administer, and use a structure, it must have the final decision in acceptance of the completed design. Lighting, heating, ventilating, structural materials, and acoustics are highly technical aspects of facility contruction. Employment of qualified designers, engineers and other technical consultants are required of all public projects and by all states.

The preparation of all contract documents is the primary responsibility of the architect, but an individual representing the coordinating committee should review them. As each phase of the drawings are completed, all members of the planning committee and other interested individuals should review carefully the layout from a functional standpoint. Suggestions for changes or questions concerning plans should be written and discussed with the coordinator and designer. This procedure should be repeated with subsequent submission drawings that include changes as agreed on by the planning committee. Acceptance of drawings allows the designer to proceed with the development of further detailed drawings and specifications necessary for facility construction.

During these phases of design, the coordinator works most carefully with the designer to help eliminate poor functional relationships of the proposed facility. Some consider this aspect of construction to be the most important in the elimination of unfortunate and costly errors.

Architectural drawings and specifications should be studied and approved by those primarily concerned with the utilization of special areas. Administrative personnel should approve those areas that are general in nature.

After the advertisement and acceptance of bids and the selection of a general contractor, monthly progress meetings should be held. This procedure provides an opportunity for those responsible to resolve any problems that develop during the construction phase.

When designing new construction of sports and recreational facilities, follow the suggested procedure above. The design of a facility, from a functional view, should be well conceived and implemented in order to meet the needs and interests of the community or institution. The importance of following this systematic procedure of employing professionals in all phases of construction can not be stressed enough. From the initial program-plant or "ed specification" prepared by a qualified educational or recreational planner to the design documentation prepared by qualified architects, landscape architects and engineers, to the final project supervision by engineer-inspectors, there is a tremendous influence and effect on safety in the facility. Almost half of the liability suits in education and recreation are a reuslt of negligence in the planning of a facility by the owners, in the designing and engineering of a facility by the designers or engineers and owners, or in supervising the construction by the clerk or the owner. The use of professionals/consultants who are expert in their business can avoid the pitfalls that lead to subsequent negligence cases dealing with the lack of consideration for safety in the facility.

FACILITY DESIGNING CONSIDERATIONS

The designer and engineer, when armed with a sound functional/spatial specification or "Ed Spec", can anticipate the requirements of the program and have available the accepted standards or criteria for the program interrelationships, space requirements, class or group

sizes, types of equipment and many other factors that insure the safety of the participants and spectators.

The following sections highlight those considerations that should be incorporated into and elaborated upon in any program or "Ed Spec" prepared in the planning process of indoor sports and recreational facilities and for outdoor sports and recreational facilities.

Indoor Sports and Recreational Facilities. Every structure that houses or contains any form of sport or other recreational activity becomes a target for potential hazards and dangers. These can become the basis for lawsuits if negligence can be proven in either the planning of the facility, in the design or engineering of the facility in the supervision of construction, or in construction of the facility. It is imperative that all features with potential for injuries or damage to life or property be eliminated. This team effort of owner's representative, such as administrators, teachers or leaders and the planner, must result in a program plant description that eliminates every possible cause of accident.

Sports and other recreational facilities are so numerous in type and variety that all considerations are impossible to cover in this chapter. However, highlights of key building elements are identified for consideration in planning.

General Building Features. In addition to instructional and recreational areas of sports facilities, operational or ancillary service areas are necessary and important parts of the total unit. All three types of building space must be considered in terms of functional-spatial relationships for the safety and comfort of spectators and participants.

The purposes of charting traffic circulation and control include (a) reducing congestion in corridors, stairwells, locker rooms, and spectator areas, (b) minimizing disturbances in quiet areas of a building, (c) providing for ease of building supervision, (d) enhancing safe and efficient movement of individuals using a facility, and (e) providing for future building expansion. (1)

Site selection and building orientation dictate primary and secondary entrances and exits, sidewalks, service areas, and roads. A careful study of anticipated movements of individuals who will use the facility is recommended. Such a flow chart will help to provide the basis for planning any sports facility.

Consideration must be given to the required movement of sports participants from areas within service units (locker rooms to shower rooms), between service units and general activity units (shower rooms to swimming pools), between service units and special units, (locker room to therapy room), and between general units or special units and spectator areas. (swimming pool and bleacher)

The interrelationships between instruction, recreation participator activity, and spectator units necessitate careful planning in activity supervision and traffic circulation.

Buildings planned, designed, supervised and constructed to minimize accident hazards should include certain features. Corridors should be well lit, of sufficient width to allow for peak traffic load, and free from all obstructions. Fire extinguishers, water fountains, telephones, and other equipment should be recessed. The minimum recommended width of any corridor is five feet. Continuous corridors that terminate at an exit or a stairwell are important in case of fire. In some buildings it may be necessary to install gates or doors to provide for the security of certain parts of a building but these should be equipped with panic or signal releases.

For slight elevation differences in floor levels, nonslip surface ramps are preferable to stairs. The rise of any ramp should not exceed one foot for every 12 feet in length and should conform to the current guidelines for handicapped access.

Stairways improperly designed and placed create problems of congestion and confusion that should not occur. A common mistake is making stairwells too narrow or with too many turns. A minimum stairway width is four feet. Two lane main stairways with a center handrail are recommended. A maximum of 16 steps is recommended with provision for a stair landing if necessary. Circular stairways are not suggested for sports facilities. A traffic flow chart within

a building will aid in the planning of area units in relation to one another. The anticipated movement of participants from out-of-doors to indoor service areas, from operational areas to instructional units, and other required movements should be studied to avoid circulation problems.

Special Area Relationships. For safety, hygienic, and supervisory reasons, the relationships of special areas of a building to other areas should be carefully studied. The following general relationships are suggested.

Spectator space should be separated from the participant decks of swimming pools and floors of activity areas. Entrances and exits to spectator areas should be from corridors or directly from out-of-doors. A sufficient number of toilet rooms located near spectator entrances should be provided for spectators separate from participants.

Special recreational activity areas should be separated from instructional and managerial units by the operational service units of locker and shower rooms. It is recommended that special areas of a building be designed to enable any single unit to be locked but with possible access to other units. Particular consideration should be given to use of facilities by community groups.

The functional relationships of parts of an area should be carefully studied to eliminate cross traffic, provide for supervision, minimize distractions, and meet maximum program requirements.

Building Utility Systems. Heating, cooling, ventilation, sound and video control, lighting and electrical service systems are, to some extent, controlled by state and local building codes. Minimum requirements or standards have been adopted for the primary purpose of public safety. While standards vary from one state to another, they do offer a starting point and tend to minimize faulty concepts and false economy.

While these services generally are included in the planning, others such as disposal, communication, storage, maintenance, and custodial are apt to be overlooked by the planning group. Suggestions in planning for building utility systems are included so that these important features are considered in the planning stages of a building program.

Cooling and Ventilating Systems. Safe and economically efficient cooling and ventilating systems are highly technical and require the professional expertise of a cooling and ventilating engineer. Quietness, draft avoidance, temperature level, maintenance of odor control, ease of maintenance and operation, flexibility of control, and capacity are important considerations of climate control. Special areas may require moisture and humidity control; swimming pools, gymnasiums, and fieldhouses require specially designed equipment. A color code for all cooling and ventilating systems aids in maintenance and repair of the system. Refrigerating systems for ice rinks also require expert consideration.

Electrical Service (1). Standards of the national electrical code of the National Board of Fire Underwriters and local and state building codes should dictate the amount and kind of installation of electrical service. Electrical requirements should include provisions for possible future expansion of buildings or programs.

If possible, the power entrance should be in a specially designed room located in a part of the building accessible only to authorized maintenance personnel. All main service panels, switches, light and power panels, and meters should be located in this area.

All panels and circuits should be protected by automatic circuit breakers. Additional spare circuits should be included in the initial plan. Electrical service panels located in corridors or rooms accessible to all should be capable of being locked with a flush type front lock fixture.

Secondary electrical service control panels are placed in various locations within the structure where they will be convenient to those individuals responsible for opening and closing the building.

Independent circuits should be provided for each of the distinct areas of the building. Lighting and power circuits to any area are best installed as separate circuits. Program systems,

communications, and fire alarm systems should all be on single independent circuits, and not in regular service conduits.

Corridor, stairway, and all night lighting should be on independent zoned circuits, with provision for three-way switches located at the end of each corridor, at the foot and head of stairs, and near the entrance of large classrooms, gymnasiums, or swimming pools. Locating switches for night lighting on the open side of interior entrances to all facilities provides convenience for supervisors and improves building security considerably.

Lighting Systems. Engineers are essential to the design of a satisfactory system of lighting a sports and other recreational facility. Quality of light is at least as important as the amount or quantity of light. Also, repair, replacement, cleaning, and initial and overall costs are important factors in planning an efficient system.

Night lights which can burn continuously are recommended for gymnasiums, swimming pools, and other areas of comparable size for security. Corridors, stairwells, locker rooms, and some classrooms should include provision for night lights. While operation costs increase with night lighting, the safety and security factors of this system outweigh the cost of operation. Night lights should be on a separate circuit and have single controls.

The prescribed building and electrical code of the local community and the state fire code must be met in providing exit lights. All exit lights must be on a separate circuit and should clearly indicate the direction to the exterior of the building. An emergency exit lighting system is essential for all areas and where a relatively large number of participants or spectators will assemble, in order to avoid a panic in case of lighting failure.

Protective covers or shielded lights are necessary for all activity areas. Vapor proof lights must be used in shower and locker rooms and rooms with high humidity. All lights should have some type of protective shield.

Shielded or break proof outside night lighting at entrances and other strategic locations will help guard against vandalism, rowdiness, and accidents.

If natural lighting is incorporated, it must be balanced with artificial lighting. Protective glare shields are necessary for natural lighting in activity areas. One of the most troublesome problems of natural lighting is sun glare, which should be eliminated.

Signal Systems. The fire, burglary, heat or other alarm systems must meet state and local fire law regulations, and should be approved by the underwriters laboratories. The systems must be understood clearly by administrators and staff who will assist in emergency evacuation of buildings.

Heating Systems. The heating system and its room is a prime hazard. All heating units must be protected whether hot air, electric, or some other form. All pipes must be protected; valves and thermostats must be covered and locked. All pipes should be cold-coded and labeled. Fire, smoke and excessive heat and pressure alarms should be installed.

Telephone Systems. Telephone service jack outlets and phones should be installed in each instructional and recreational space for special or regular use if desired. Pay telephone units should be installed in sports and recreational facilities for the public's convenience. Independent telephone service is recommended for specific areas of a building which might be used when other areas are not. Local telephone companies maintain consultant services to help in planning such arrangements. An owner and his planners and engineers could be proven negligent if a means of communicating with off-property emergency services is not initially strategically located.

Communication Systems. Public address and a system of intercommunication among parts of a building should be provided. These sound systems must be flexible in design with microphone outlets located in areas of anticipated use. An outdoor system is needed as well.

Sound Control. The importance of sound control in sports and recreational facilities is readily apparent to those involved in the administration of a sports program. Sound control requires the recommendations of an acoustical engineer. A good public address or intercom system can be used for periodic information, for warning instructions or for background music.

BUILDING SERVICE AREAS

Locker rooms, drying rooms, shower rooms, storage areas, equipment issue rooms, toilet rooms, and custodial rooms are designed for the convenience and comfort of the participant. Since these areas are often potentially hazardous, they must be designed to eliminate or minimize features which may contribute to accidental injury. Provision should be made for clean, light, and attractive service facilities capable of being effectively maintained.

Locker Rooms. Although no attempt is made here to consider the many types of locker rooms, general suggestions concerning desirable features of locker rooms are presented.

Ideally the locker room should be located to enable participants to pass to activity rooms without crossing public corridors. If possible, this service facility should serve both indoor and outdoor sports facilities. Preferably located above ground level, locker rooms should have a functional relationship with shower rooms, lavatories, and equipment issue rooms.

Light colors for floors, walls, ceilings, and lockers are recommended. Well lighted, colorful locker rooms will help offer a sense of cleanliness and health.

Nonslip, impervious floors are essential in most service areas. A textured type floor finish will help prevent accidents resulting from slipping and falling. Floors should be sloped toward drains to facilitate cleaning. They should have coved moldings to facilitate cleaning. They should not contain any depressions. Lockers should be placed on raised covered front bases, and all junctions of base and floors coved with impervious material similar to that used on floors. Smooth walls of moisture resistant materials which permit cleaning are recommended. Ceiling must be moisture resistant and not contain hung tiles which can be dislodged.

Benches built into the floors with a minimum of uprights are initially more costly but have the advantage of making cleaning more efficient and reducing the hazards of aisle benches.

Sight barriers should be considered for entrances and exits to locker rooms. If entrance and exit doors are used, they must be equipped with approved panic bars.

If windows are to be included they should be installed above locker height and considered a part of the ventilating system.

Recessed hose bibs and key controlled electrical outlets are necessary.

Shower Rooms. Suggestions for walls, ceilings, and floors of locker rooms are also applicable for shower rooms. Materials used in the construction of shower rooms must be easy to clean and free of sharp corners. Noncorrosive metal is a basic requirement for shower and plumbing hardware. An adequate drainage system is important to allow for surplus water and soap to be carried away quickly. Handholds placed near shower heads help control falls.

The use of liquid soap is desirable. Whatever type of soap supply system is provided, clearly posted policies regarding the proper use of the shower room will help prevent accidents arising from horseplay. The individual bar type of system may increase the danger of falls if soap is allowed to remain on the shower room floors.

The temperature of water in showers and sinks should be automatically controlled to prevent scalding.

Toweling Room. A toweling or drying room is usually included as a part of the facility. All suggested policies on material and design for shower and locker rooms are necessary here, too. Towel bars or towel hooks, properly positioned, should be provided for convenience and safety.

LAYOUT

Sports and recreational facilities must be carefully laid out to avoid a multitude of potential problems.

Congested activity spaces, dark hallways, hidden steps, activities not adapted to site, lack of bicycle racks with bicycles strewn around, inadequate fencing for protection, exposed rootings and sharp thorny plantings are but a few of the problems that can be encountered with a poor

layout. Not only is the safety of a facility affected, but the convenience and comfort of the users interrupted. The program plan and resulting construction drawings and specifications must reflect a careful consideration of orientation, location and juxtaposition of facilities and utilities.

HYGIENE

Sports and recreational facilities involve activities that: a) use water such as in swimming and therapy pools; b) incorporate sinks, showers and laundering and dressing rooms; c) have vending machines, food concessions and dining rooms; and d) encompass medical and first aid facilities. Therefore, hygiene is important in insuring safety. The cleanliness, sterility, neatness, chemical quality, water purity, and many other concerns affect the hygiene of facilities, supplies and equipment in sports and related facilities. An accident brought about by improper hygienic considerations in planning, designing, installing or maintaining the facilities often introduces liability questions based upon negligence.

MAINTENANCE

Recreational facilities receive heavy misuse and abuse and therefore require facilities, supplies and equipment that can be easily maintained, and have longevity and durability. Such facilities and equipment must also have simplicity in manufacture and installation as well as serviceability. Fixtures, fittings, devices, connections and all parts must not be susceptible to breakdowns or failures that could result in injury or damage. Nor should there be exposed bolt ends, electrical wires, moving parts, vise grip joints, small holes, sharp edges or any other such potentially dangerous conditions. All pipes, parts, conduits, valves, drains and outlets, containers for gasoline or other chemical solvents, storage cans, and cabinets for tools and equipment should be clearly marked with appropriate warning signs and symbols.

CONTROL

Since sports and related recreational facilities involve small to large numbers of participants, staff and spectators, adequate control measures must be considered to insure crowd control, proper direction and supervision of users and orderly functioning of the facility. Control measures include intercom, signal, telephone, speakers, signs and hand signals. Facilities should have clear vantage of all corridors, stairways and dark spaces. Locker rooms, toilet facilities, entrance and exits and storage areas should be controlled areas with vending machines, coat checks, telephones, drinking fountains, ticket booths and other spaces clearly visible to supervisory personnel.

SECURITY

Sports facilities include a wide variety of apparatus and equipment which require maximum security when not used in an organized program. Gymnastic apparatus such as trampolines, high bars, rings, parallel bars, lifeguard stands and all other equipment could be considered attractive nuisances if improperly supervised or secured. Swimming pools, weight training rooms, sauna baths, and gymnasiums must be planned with security features in mind.

Most important, security starts with a well planned lock and key system designed to control a building or any specific area within a building. Consultation with lock hardware experts will help eliminate many of the problems resulting from an inadequate system.

Again, night lights, both inside and outside a building, are strongly recommended to help control illegal entry, vandalism, and accidents.

Closed circuit security guards or night watchmen should also be considered. Signal alarms, intercommunications, and telephone systems play an important role in maintaining building

security.

State and local codes related to the building and its use must always be considered in the final plans.

ACTIVITY AREAS

Gymnasiums. There is no attempt here to recommend gymnasium standards because of the multiple uses for which a gymnasium may be constructed. Suggestions for minimizing the potential safety hazards of a gymnasium are presented rather than detailed specifications, which are readily available in other publications.

When gymnasiums are planned for multiple use, a careful study should be made to insure that any one activity will not interfere with any other activity. This guideline seems obvious but is often overlooked.

A safety zone between court areas and between courts and walls or bleachers should be wide enough to prevent injury of participants. A minimum ceiling height of 24 feet is suggested for all multiple use gymnasiums. This minimum will accommodate all activities included in a physical education or athletic program.

Because of glare, many contemporary structures do not have window or natural lighting. If windows are to be a part of the gymnasium they should be shatterproof and translucent to eliminate direct sunlight. Skylights have not been satisfactory.

Wall areas should be free of protruding obstructions, and when special equipment is necessary, it should be recessed. Structural facing tile to a height of seven feet on lower walls has proven most satisfactory in many instances. It is smooth and easily cleaned.

According to state fire codes, the maximum number of spectators anticipated dictates the number of exits required.

Seating of spectators may be accomplished by permanent seating, roll-away bleachers, portable knockdown bleachers, or a combination of these. Whatever type of spectator seating is selected, a maximum of 20 rows of continuous seating is recommended.

A storage facility large enough to store all gymnasium equipment should be located adjacent to that area. Side horses, parallel bars, trampolines, and other equipment should not be left in an unsupervised gymnasium. A storage room with a secure lock arrangement will help to eliminate accidents caused by unauthorized use of gymnastics apparatus.

In general, activity areas require a wooden or approved synthetic type floor. Special consideraiton must be given to floor plates or other anchoring devices for gymnasium equipment.

Natatoriums. One of the most potentially hazardous activity areas included in facilities for sports and recreation is the swimming pool and appurtenances. The very nature of swimming and its environment demands that special consideration should be given to the design, features and fixtures of the area. A swimming pool is expensive and requires continuous maintenance and supervision. If operated improperly the pool can be a safety and health hazard.

Swimming pool design is a highly specialized and technical phase of architecture and engineering. Planning for the construction of a swimming pool requires the services of expert consultants. Problems of size, humidity, depth, filtration, and spectator space figure in the construction of such a facility. Conflicting uses for the pool must be resolved by the planning committee prior to the development of detailed plans.

Rectangular pools are the most functional type. If competitive swimming is included in the proposed use, the pool must be designed according to AAU, NCAA or FINA specifications.

Safety features of the swimming pool area must include the following for minimum protection of participants.

1. Deck space. There should be a minimum of eight feet of deck space constructed of nonskid material around the entire pool area.
2. Board space. A minimum of 10 feet from a platform and 15 feet from a diving board is

required in determining ceiling height. High boards should have a minimum distance of 10 feet between boards and between the board and the deck. A clearance of at least 15 feet for low boards and 20 feet for high boards is required in front of the boards.

3. Depth markings. These are necessary on the sides and ends of all pools.

4. Hardware. Insuring security of areas is an important consideration. All hardware should consist of approved fixtures and fittings.

5. Alarm system. Alarms indicating the presence of individuals in the pool when not supervised have been installed in many recently constructed pools.

6. Underwater lighting. Underwater lighting of the pool is essential.

7. Lifeguard chairs. Moveable stations are recommended over stationary chairs.

8. Maintenence. Hygienic standards must be met relative to water filtration, showers, and pool maintenance.

9. Underwater windows. If these are installed, a provision for escape should be included in case water pressure breaks windows.

10. Diving boards. Boards higher than one meter should include ladders with guard rails. If a tower is used, an enclosed ladder should prevent unskilled divers from using the platform.

11. Spectator bleachers. Handrails and guard rails should be included in spectator areas.

12. Entrance and exits. Accesses should be planned relative to shower, toilet, and locker services. Spectators should not have access to the pool deck.

13. Storage areas. Special storage areas are often forgotten in planning swimming pools but they are necessary because of the variety of activities included in pool use.

14. Ancillary storage. If scuba is to be included in the aquatic program, provision must be made for compressor and cascade systems for filling tanks.

Special Activity Areas. Dance studios, weight exercise rooms, gymnastic rooms, handball and squash courts, wrestling rooms, rifle ranges, and adapted physical education rooms are only a few of the many types of activity areas found in a modern sports structure.

Each of these areas presents unique problems in size, shape, special equipment, and ceiling height. Enlisting the aid of program specialists in each area will minimize safety hazards.

The most important factor to consider in an activity area is the floor and its finish. A floor with a hard finish that allows participants to slide or move fast should be utilized in rooms designed for specific activities.

A minimum of 60 square feet per student at peak load is desirable for those rooms planned to accommodate classes in judo, wrestling, karate, and personal defense. Resilient walls are essential for protection of the participant in many of these activities.

Reference

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Chapter 8

The Significance of First Aid and Emergency Procedures

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First aid is a fundamental aspect of injury control; first aid training is compatible with a need to plan for accident prevention. While an analysis of statistics on sports injuries might imply that there is no significant impact from first aid training, this is untrue. First aid training develops in individuals a high degree of sensitivity to the serious effects of injuries and instills a desire to prevent the causes of such injuries.

First Aid Factors

Because of their knowledge of the effects of injury with regard to pain, disability, financial costs, and loss of life, persons trained in first aid want to use preventive measures. Since first aid training instills this attitude, the training should be required for everyone involved in an educational leadership role.

Medical advice. The content of well developed first aid courses is established by the medical profession, since such material is an extension of medical knowledge and skill. The actions of the layman in providing emergency care must have the endorsement of the medical profession. A medical adviser is needed to plan and implement a system of injury control for organized sports programs. Formulating an emergency plan provides an opportunity to establish rapport between the layman and medical profession. The result of a coordinated lay and medical effort to develop guidelines and perimeters of action will alleviate misunderstandings and improve care procedures. A continuing analysis of injury accident causes, effectiveness of first aid care, and follow-up medical treatment should be made to obtain information for improving safe sports participation and emergency care procedures. A scientific data bank of such information would be of significant value in establishing improved sports participation guidelines.

Participant responsibility. The great variety of sports activities, environmental elements, and differing locations creates special problems for first aid or emergency care action. The circumstances of a skiing accident, involving a very cold environment and difficult transportation of the injured person in a location far from the medical care, involve a different set of problems from an accident on a football field where the physician and ambulance are on site. The problems involved with an injured hunter many miles from help, or the person on a boat suffering from a compound fracture far from shore, are more profound than those for the person with a similar injury in his home.

Some serious injuries call for immediate first aid, such as when breathing ceases, when there is a large blood loss, or when there are other life-threatening situations. In emergency first aid cases, a few minutes can mean the loss of life or permanent disability. When there is no time to

seek help, first aid must be provided by the person on site if life is to be saved. The circumstances of sports participation define a need to recognize the frequency of serious injuries requiring first aid and to respond intelligently and quickly.

Leadership responsibility. Leaders in organized sports programs must be responsible for the protection of participants. Because of the frequency and severity of sports injuries, those with the responsibility must make first aid care a routine matter and not something used on an occasional basis. Analysis of injury severity often indicates that poor judgment has been made. The so-called minor accident with an estimated "slight ankle sprain" has often turned out to be a serious fracture, resulting in possible aggravation of the problem, longer disability, and even permanent damage. There is cause for concern in a situation where a neck fracture occurred but the participant was pulled off the playing field with no attention given to the critical nature of the injury. A physician will use an X-ray to determine if a fracture has occurred, yet sports leaders often pay little attention to evidence of injury and take a chance by ignoring the possible serious implications of the injury or even encouraging continued active participation. The serious effects of high humidity and high temperatures resulting in heat stroke and heat exhaustion have been well defined, yet many sports leaders show a lack of concern.

Emergency planning. All organized sports programs should have a well defined plan for responding to emergencies. The plan should be developed through consultation with persons having particular interest, competence, and experience, such as, physicians, school administrators, safety officials, police, fire departments, hospital authorities, teachers, and student leaders. The individuals responsible for implementing the plan must practice procedures at frequent intervals to insure operational competence. Mock accident injury situations, with a response to the emergency evaluated by a combined medical and sports leadership group, will help make a plan more effective.

The written plan should contain simple procedural steps to be taken by persons who assume various levels of responsibility. The system of response to an emergency should set in motion operations that will bring immediate assistance and also inform higher authorities of the existing conditions.

All accidents, illnesses, or injuries should be handled in accordance with the master plan adopted by the school administration. Telephone numbers of designated physicians, hospitals, and ambulances should be posted in places accessible to the person in charge of the activity at or away from the school or sports facility.

The plan should provide that any individual recognizing an emergency has a responsibility to report it immediately to the person in charge of the activity or area. The person in charge should carry out emergency care procedures, retaining responsibility until relieved by school or medical authority. Specific procedures should be developed for emergency evacuation, panic prevention, and the handling of emergencies at public events. Evacuation drills should be practiced in all school areas, including athletic fields, gymnasiums, swimming pools, showers, and locker rooms.

One person in each school or sports area should be responsible for obtaining medical assistance. This procedure should be clearly defined in the written operational plan, and the medical facility authority should be provided with the essential details of the type of emergency and the scope and type of assistance required. Preplanning with physicians, ambulance personnel, rescue squad, hospital, police, and fire departments should define locations of facilities, entrance and exit routes, identification of responsible sports authorities, and the communication plan used by the school or sports authority. Transportation of injured or ill persons should be provided as recommended by a physician, or if a physician cannot be contacted, upon the basis of sound emergency care procedures.

If, after contacting the parent or guardian, it is decided that the injured or ill person should be sent home in a properly authorized vehicle, he should be accompanied by a representative of the school or sports authority who should remain with the individual until he is delivered to the care

of a parent or guardian.

Immediate notification concerning significant emergencies must be given to school administrators or sports authority by the person in charge. As necessary, the administration should notify the parent or guardian. The release of information regarding an emergency is the responsibility of the school or sports administration only.

Records should be kept on all emergency care provided and retained as recommended by legal counsel.

Permission for a participant to return to a sports activity should be authorized by a physician and verified by a final written approval of the school or sports administrator. A record of "permission to return" should be retained in a permanent file.

First aid supplies. Suggested essential first aid supplies (3:228) are listed in Table 1. These supplies should be readily available in a clearly marked first aid kit, cabinet or training room.

Table 1
Suggested First Aid Supplies

First Aid Item	*Use*
1. Sterile first aid dressing in sealed envelope 2"x2" for small wounds.	1-3 For open wounds or dry dressings for burns; these are packaged sterile so do not try to make your own.
2. Sterile first aid dressing in sealed envelope 4" x 4" for larger wounds and for compress to stop bleeding	4. Finger bandage
3. Small sterile compress with adhesive attached in sealed envelopes	5. To hold dressings in place
4. Roller bandage 1"x 5 yds.	6. To hold dressings in place
5. Roller bandage 2"x 5 yds.	7. For sling; a covering over lg. dressing
6. Adhesive tape, roll containing assorted widths	8. For cleaning wounds, scratches, cuts
7. Triangular bandages	9. Swabs or pledgets for cleaning wounds
8. Mild soap	10. For making swabs
9. Absorbent cotton, sterilized	11. Splinting broken fingers and stirring solutions
10. Applicator sticks	12. For cutting bandages or clothing
11. Tongue blades	13. To remove stingers from insect bites or to remove small splinters
12. Scissors with blunt tips	14. For splinting broken arms and legs
13. Tweezers	15. For shock — dissolve 1 tsp. salt
14. Splints ¼" thick, 3½" wide, 12-15" long	16. and ½ tsp. baking soda in 1 qt. water
15. Table salt	17. Local relief of pain
16. Baking soda	18. Local relief of pain and to prevent or reduce swelling; burns
17. Hot water bottle with cover	19. For use in severe injuries when no other method will control bleeding
18. Ice bag	20. For rinsing eyes
19. Tourniquet. Wide strip of cloth 20" long, and a short stick	
20. Eye dropper	

First Aid Practices. Materials describing first aid practices to be employed in common injury situations should be posted and referred to frequently along with reviews of up-to-date text materials.

Bones and Joints

Fracture — Never move athlete if fracture of back, neck, or skull is suspected. If athlete can be moved, carefully splint any possible fracture. Obtain medical care at once.

Dislocation — Support joint. Apply ice bag or cold cloths and protect from further injury. If severe, refer to physician at once.

Bone Bruise — Apply ice bag or cold cloths and protect from further injury. If severe, refer to physician.

Broken Nose — Apply cold cloths and refer to physician.

Heat Illnesses

Heat Stroke — Collapse WITH DRY WARM SKIN indicates sweating mechanism failure and rising body temperature.

THIS IS AN EMERGENCY: DELAY COULD BE FATAL.

Immediately cool athlete by the most expedient means (immersion in cool water is best method). Obtain medical care at once.

Heat Exhaustion — Weakness WITH PROFUSE SWEATING indicates state of shock due to depletion of salt and water. Place in shade with head level or lower than body. Give sips of dilute salt water, if conscious. Obtain medical care at once.

Sunburn — If severe, apply sterile gauze dressing; refer to physician.

Impact Blows

Head — If any period of dizziness, headache, incoordination, or unconsciousness occurs, disallow any further activity and obtain medical care at once. Keep athlete lying down; if unconscious, give nothing by mouth.

Teeth — Save teeth if completely removed from socket. If loosened, do not disturb; cover with sterile gauze and refer to dentist at once.

Celiac Plexus — Rest athlete on back and moisten face with cool water. Loosen clothing around waist and chest. Do nothing else except obtain medical care if needed.

Testicle — Rest athlete on back and apply ice bag or cold cloths. Obtain medical care if pain persists.

Eye — If vision is impaired, refer to physician at once. With soft tissue injury, apply ice bag or cold cloths to reduce swelling.

Muscle and Ligaments

Bruise — Apply ice bag or cold cloths, and rest injured muscle. Protect from further aggravation. If severe, refer to physician.

Cramp — Have opposite muscles contracted forcefully, using firm hand pressure on cramped muscle. If during hot day, give sips of dilute salt water. If recurring, refer to physician.

Sprain — Elevate injured part and apply ice bag or cold cloths. Apply pressure bandage to reduce swelling Avoid weight bearing and obtain medical care.

Strain — Cold, apply pressure bandage to prevent swelling, rest, follow with heat or warm: wet, applications after two or three days. All back strains should be seen by a physician.

Open Wounds

Heavy Bleeding — Apply sterile pressure bandage using hand pressure if necessary. Refer to physician at once.

Cut and Abrasion — Hold briefly under cold water. Then cleanse with mild soap and water. Apply sterile pad firmly until bleeding stops, then protect with more loosely applied sterile bandage. If extensive, refer to physician.

Puncture Wound — Handle same as cuts, and refer to physician.

Nosebleed — Keep athlete in a sitting position, leaning forward, if possible; cover nose

with cold cloths. If bleeding is heavy, apply pressure directly at the site of the bleeding by pressing the bleeding nostril toward the midline and place a small gauze pack in nostril or nostrils. If the bleeding continues, refer to physician.

Other Concerns

Blisters — Keep clean with mild soap and water and protect from aggravation. If already broken, trim ragged edges with sterilized equipment. If extensive or infected, refer to physician.

Foreign Body in Eye — Do not rub. Gently touch particle with point of clean, moist cloth and wash with cold water. If unsuccessful or if pain persists, refer to physician.

Lime Burns — Wash thoroughly with water. Apply sterile gauze dressing and refer to physician. (4,5)

Equipment for emergency care should be placed in areas where it is readily available for use by authorized personnel, particularly in high hazard areas such as gymnasiums, playfields, swimming pools, and locker rooms.

An inventory of carefully selected emergency care supplies and equipment with their locations should be maintained in a central office. Emergency care kits including coins for phone calls should be available for supervised activities away from school or home sports area. A telephone should be near all activity areas. An emergency care facility should be provided convenient to activity areas.

Leadership

The basic ingredient for improving the injury control system for sports is trained leadership. The training plan must be developed with a recognition that our best efforts to safeguard participants cannot be totally successful. Accidents, injuries, and illness will be encountered, and sports leaders have a direct responsibility to respond with intelligence and skill.

The best defined policies and procedures will be effective only if they are carried out by persons with proper training. Sports leaders should: a) have the ability to recognize the symptoms of injuries and illnesses, b) exercise judgment in providing emergency measures, and c) understand the limitations they have as laymen for treatment. Referral of participants to a physician should not be delayed if there is any doubt concerning the severity of the problem.

First aid should be recognized as an immediate and temporary care given to a victim of injury or illness until the services of a physician can be obtained.

All faculty and staff should receive competent instruction in first aid. Periodic refresher courses should be offered to maintain a high degree of skill in providing emergency assistance.

Persons teaching and supervising physical education, athletic, and recreation activities should have first aid competence, secured through an American National Red Cross advanced first aid course or its equivalent.

All persons designated as athletic trainers, whether students or faculty members, should have advanced first aid training as a minimum requirement and, in addition, should have further training by a physician.

In-service training, including practice of first aid procedures, should be held at scheduled intervals. First aid frequently requires a team approach, and this type of skill practice should also be conducted. The medical adviser should be involved in original training and follow-up practice sessions.

The frequency and severity of injuries and illness from sports participation and the peculiar problems created by the variety of environmental conditions place a great need for a high degree of first aid competence for sports leadership and participants.

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