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by  
HARLEY DALE CULBERSON  
July 28, 1962

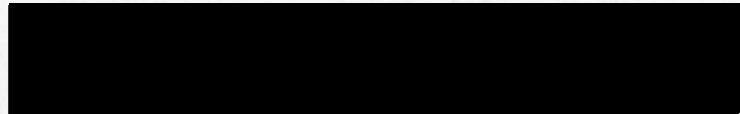
SAFETY IN VARSITY SPORTS

A TERM PAPER  
IN PHYSICAL EDUCATION 461  
EASTERN ILLINOIS UNIVERSITY

IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE IN EDUCATION  
PLAN B

This paper has been approved as partial fulfillment of the requirements for the Degree of Master of Science in Education.

Approved by



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## INTRODUCTION

With the growing interest in sports and their inclusion in the curricula of educational institutions, safety in sports has become increasingly apparent inasmuch as effective procedures for the prevention of unnecessary accidents must be established.

The problem of safety in sports was selected for study so that material could be organized and prepared for use as a guide for coaches in the field. Many of these coaches were trained in an era when safety was not considered essential.

Since many of these coaches will continue to assume responsibility in sports and since injuries have caused many parents to look upon these activities, particularly football, with much disapproval, the coach should execute a program with the highest degree of safety.

The writer used statistics from F. S. Floyd, G. G. Deavers, and F. R. Eastwood, books on Safety in Athletics several times. This book is an old reference, but most of the recent books, pamphlets, and magazine articles quote figures from their book.

In this paper the word sports is referred to by this writer as the sports that are played in his school. These sports are: football, basketball, baseball, track and field, golf, and tennis.

The word safety in this paper means prevention of injury.

This problem is set up so that it may be used as a program of instruction in this field. Philosophy and psychology in respect to safety are also considered. A series of controls are then set up which includes controls of leadership, facilities and equipment, and those participants in the sports listed.

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CHAPTER I  
PHILOSOPHY AND PSYCHOLOGY OF SAFETY

Albert W. Whitney<sup>1</sup> expressed clearly a philosophy of safety education. It is:

Danger is inherent in life, viewed both objectively and subjectively. From an objective point of view life is an adventure, for we are by the compulsions of our nature and our environment constantly pushing on into new and unknown and hence dangerous fields. Danger is inherent in life subjectively as well, for we are emotionally keyed to adventure, and a life that does not have the quality of adventure in some form is less interesting. Safety is in reality a symmetrical concept; it has a negative side of equal significance. We are to be saved "from" something but only in order to be saved "for" something else. Safety is, therefore, substitutional, not negative, and since the field of safety is adventure, what it does is to substitute a good adventure for a poor adventure.

Safety has increased the adventures in the world today by permitting us to understand and control the hazards of our age. Without safety our world would be a difficult place to live. If we understand the dangers and are able to control them we reduce our fears and permits us to live in a world that is more emotionally stable. Under controlled conditions that give us safety, we embark upon more adventure.

Safety in our world today does not mean safety from accidents alone, but also control of man's power through his use of nature. Control of man's environment means that there should be safety against purposeful assault as well as safety from carelessness. In either case it is a result from failure to control the conditions of life.

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<sup>1</sup>A. W. Whitney, Safety Education; Eighteenth Yearbook, (American Association School Administrators, 1940), pp. 18-19.

To reduce hazards we must make an effort to develop a well-controlled culture. We must endeavor to see that all are informed and understand the need of safety. In addition to understanding needs for safety the individual should possess safe skills and the ability to execute these skills, and lastly these individuals must have attitudes that are desirable in the light of safety. These attitudes are needed so that safety knowledge will be applied in a desirable manner. The attitudes will permit the individuals to control themselves in a manner which will not jeopardize themselves and others. The student is a product of his culture. Nevertheless, it is a responsibility of the instructor to establish desirable attitudes. This may be done through many devices, one of which may be travel to areas in which safety is paramount, thus laying the groundwork for desirable attitudes.

Personal influence or expert opinion is another source of safety education. Experts may make strong appeals in connection with certain activities. Lectures may be used but pictures, slides, and demonstrations should be used to reinforce the lecture. Propaganda through slogans, posters, motion pictures, press, radio, and television may be used in forming desirable attitudes.

Self-government by students also reflect desirable student attitudes toward safety education. In the prevention of accidents, the mental state of the individual is most important, thus this area must be given increasing and constant consideration by the instructor.

The cause of most accidents can be attributed to the human element. An immature mind in a mature body, an emotional disturbance, a maladjustment that can be traced to a childhood experience, or an antisocial attitude bred by a deep-rooted resentment to society are among the factors responsible for accidents.

Some of the other psychological factors that tend to cause accidents are; worry, grief, anger, and hate. These factors are both biological and cultural in their aspect. Glandular action is important, in controlling muscular fatigue and reactions in conditions of anger. Thus, it is important that the individual must develop controlled emotional responses and attitudes.

Individual difference is another area to be considered. It is important that these individual differences be known and studied when efforts are being made to set up safety controls. Many accidents are caused by physical inadequacies such as defective vision which would include acuity, side vision, color blindness, night blindness, and depth perception, hearing, lack of coordination, that is reaction time, blood pressure, nervousness, and various others.

Interest must be the concern of all who are interested in safety education. Interest may be motivated and maintained through appeal to one or more of the personal desires of individuals. These desires are, self-preservation, reward, loyalty, pride, rivalry, leadership, and responsibility. Alertness on the part of the instructor may give many sources for promoting and maintaining interest.



A school can judge the over-all effectiveness of its accident-prevention efforts by studying the records of its alumni and students to see how well they have adjusted to their environment. Since external conditions are not static, the safety program may have to be modified from time to time to meet changing needs.

The writer believes by bringing boys up through a good intramural program in the junior high and having boys play with their own age level and physical development group through high school, many injuries could be prevented.

Certain basic principles should be considered by all persons who contemplate participation in sports.

Stack and Elkow<sup>2</sup> lists the following principles:

1. Have an annual medical examination to determine your capacities to participate in vigorous sports during the year.
2. Be in good condition physically and emotionally when engaging in recreational activities.
3. Participate in activities only when properly equipped.
4. Use sports equipment only for the purpose for which it is intended.
5. Know the hazards of the sport in which you are engaged.
6. Learn how to cope with or remove hazards.
7. Do not create any unnecessary hazards.
8. Do not carry on an action without informing others of what, where, and when you are going to act, especially if some hazards are inherent in the activity either to yourself or to others.
9. Know when to send for help and where to find it when needed.

<sup>2</sup>  
Herbert J. Stack and J. Duke Elkow, Education for Safer Living, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1957), p. 97

10. Take time to plan the activity in which you will participate.
11. Allow for ample periods for rest and relaxation. Pace yourself.
12. Practice moderation in sports participation. Do not over-exert yourself. Play in accordance with the knowledge of your capacities.

The writer also believes that receiving adequate instruction before participating in such sports as land and water skiing is also of considerable importance.

## CHAPTER II

### LEADERSHIP CONTROLS

Adequate leadership is essential in sports if the full educational results are to be achieved and the activities are conducted in such a manner that unnecessary accidents are reduced or eliminated. Good leadership does not always produce satisfactory results. The coach who wins regardless of the consequences offers little in educational value and his objective to win in some cases may cause the sacrifice of players, through injuries of serious nature.

Many individuals exert leadership of one type or another upon individuals participating in the sports program. In this portion of the paper the writer wishes to take into consideration those individuals who exert an influence directly within the sports program. These individuals are the administrators, coach, student managers, and the participating group.

#### Administrative

The administrative leadership of a good sports program should make every effort to prevent accidents. The principal, athletic director, coach, managers and the participating group should play an important role in any safety education program. Only through cooperative measures from all of these administrative areas can safety programs be effective.

The National Safety Council<sup>3</sup> lists the following General Administrative Principles:

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<sup>3</sup>National Safety Council, Safety in Sports, General Practices, (Safety Data Sheet No. 75, Chicago, Illinois, Copyright, 1956).

1. Every prospective sports participant should have a thorough physical and medical check-up, including a chest X-ray, at the beginning of the season, a followup examination at mid-season, and a concluding examination at the close of the season. The record should also include the parent's written consent that the boy be allowed to participate.
2. A good accident reporting and record-keeping system should be established. When analyzed, such reports can be used as a guide for the improvement of instruction; they can become the statistical base from which to coordinate a program of safety.
3. Periodic surveys of the physical education plant should be made, accompanied by the coaches and the custodians, and definite follow-up procedure of correcting unsafe situations established. The athlete should be performing in a safe an environment as possible.
4. Insurance to cover pupils involved in accidents is receiving increased attention in schools. It provides some protection to pupils for reimbursement of expenses incurred as a result of accidents. It does not, however, relieve teachers of personal liability.
5. The quality of personnel and the playing standards of the opposition should be taken into account when drawing up schedules. Equality of competition is a desirable standard to adhere to in arranging games.
6. All schools should play under the rules specifically designed for their respective groups. Provide for local ground rules in cases where the safety of a performer is involved.
7. Teams should be transported as a unit where possible, utilizing insured school buses and qualified drivers.
8. The judgment and skill of the official determines to a great extent the manner in which the rules of safety are enforced. Only competent, trained and qualified officials should be hired to handle the game.
9. The administrator should encourage the research necessary to determine the causes of accidents and injuries that happen within his jurisdiction. He should know what to do when an injury occurs and how to prevent such an injury from occurring in the future.

10. Definite safety instruction and opportunity to practice safety measures should be provided the student body in general, and specific instruction provided for the players in the peculiarities of the sport in which they are involved. Such instruction would include a thorough knowledge of the rules of the game.
11. In drawing up schedules for the various sports, suggestions of authorities in the field and state organizations should be followed in providing a reasonable number of games. Long, over-emphasized seasons are hazardous.
12. A first-aid room, adequately stocked, should be made available to all play areas. A physician should be present at all contests and on call during the practice sessions. The coaching staff should be qualified and experienced in first aid administration. In cases of doubt, the physician should be notified immediately.
13. Sufficiently large play areas which will absorb participants easily and prevent overcrowding should be provided.
14. Safe bleachers, police and fire protection, ushers and guards, and control of the play area should be provided as safety measures for the spectators.
15. Inter-school competition for boys below the tenth grade is a questionable practice. If such competition is provided for that age group, special physical requirements and standards should be used to assure equality of competitors.
16. Enough coaches should be provided to assure close supervision of all practices. This means at least two coaches if four teams are playing.
17. In sports featuring a number of different events, the number of events a boy can enter should be limited. Some states, for example, limit the number of events a boy can enter to two track events and one field event, or three track events providing no race is longer than 440 yards.
18. Authorized activity in a sport should be limited to the season it is in progress.
19. Only tournaments that have the official sanction of the schools should be entered.
20. Administrators and coaches should take an active part in drawing up educational and safety specifications for new construction of play areas.

21. Adequate and controlled parking facilities should be immediately available to playing fields, gymnasiums and fieldhouses. Special provision should be made to handle traffic on the day or night of the game.
22. Regular reports as to the working conditions of exit doors, emergency doors, fire escapes, extinguishers, hoses and signals should be made part of custodial and administrative routine.
23. The fundamental skills of the sport involved should be progressively taught, thoroughly learned and consistently reviewed.
24. Learning of the fundamental skills should parallel a conscious attempt by the coach to develop good physical condition in each boy. Each individual needs a different approach, each sport needs a different kind of conditioning to reduce accidents caused by poor physical stamina effectively.
25. Fatigued athletes are bad risks, and athletes can become mentally exhausted as well as physically exhausted. A coach needs to know the symptoms of "staleness" and the methods of preventing and curing such conditions. The lowered threshold of alertness resulting from fatigue is a hazard of competitive athletics.
26. Abnormal emotion and attitude may make an athlete more susceptible to accidents. Boys and girls should be taught the elements of good sportsmanship, for they are effective control factors as well as our justification for competitive sports.
27. Homogeneous grouping of individuals is helpful in reducing the number and severity of accidents. Participants often need to be made aware of their limitations and made to be more selective in the type of sport in which they want to excel.
28. Intelligent leadership would require preparation and qualification in the field of safety education, and a conscious effort on the part of the leader to keep himself well-informed in current method and thought.
29. Leadership training programs should include a thorough knowledge of first aid procedure in all imaginable situations that might involve an athlete.
30. No activity should be permitted to proceed for which adequate equipment cannot be provided. The use of defective equipment and faulty apparatus should not be permitted.

31. A definite system of caring for the injured should be established and understood by the participants, the parents and the school officials.
32. A carefully planned system of warming-up should be developed by each athlete to fit his particular needs, and adhered to before every contest of strenuous performance. The coach should teach the athlete adequate warm-up preparation.
33. A pre-planned and controlled amount of time should be devoted to practice sessions. Close supervision and planning is especially important at the beginning of the season. Long practice sessions, in which players become unduly fatigued, should be avoided.
34. Build confidence. The inexperienced, unsure athlete should be exposed to a series of experiences proceeding gradually from the simple to the more complex. Fear of injury often makes a player susceptible to injury.
35. Careful observation of the condition of the players as the contest proceeds, and substitution at the proper moments, if necessary, are attributes of the coach whose primary concern is the safety of the participants.
36. Because excessive fluctuations of weight can indicate serious organic deficiency or disease, as well as over-work, a constant check on the weight of participants is a natural safeguard.
37. Health is a prerequisite to safety. Teach it and maintain it. The reflexes, stamina and mental alertness of good health are essential to player and team safety.

#### The Coach

The coach is probably the most important person in the safety program in sports. The coach should be one who is well-trained and experienced in his field. In most cases, the coach should be a man who has had actual experience in playing the game himself. Coaching for the sake of the game and with the purpose of winning at any cost, rather than for the sake of the players, will result in undesirable educational and safety results. The better training

a coach has had, the greater is the probability that the boys under his care will receive good instruction. Generally speaking, members of better instructed teams receive injuries less frequently than do those who do not understand how to play and to protect themselves in a sport.<sup>4</sup>

Lloyd<sup>5</sup> further states that 31 per cent of all accidents and 30 per cent of the days lost are caused by improper leadership controls; of these 40 percent are due to improper supervision during the activity.

Every coach has a stake in the safety of all boys under his control. If a player is hurt, his efficiency is impaired, and the team suffers accordingly. The coach should devote many hours to the careful instruction of his players in the various fundamental skills of the sport and in giving "tips" that will add protection in executing these skills.

Seaton<sup>6</sup> says if the following three general principles are followed it should result not only in fewer accidents but also in a much healthier athletic situation.

1. The community, largely through the attitude of the coach and the school's administrators, should be taught not to be too demanding of the school's athletic teams.
2. The coach's concern should be focused primarily upon the health and safety of the players under his direction.

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<sup>4</sup>F. S. Lloyd, G. G. Deaver, F. R. Eastwood, Safety In Athletics, (Philadelphia: W. S. Saunders Company, 1939), p. 36.

<sup>5</sup>Ibid., p. 36.

<sup>6</sup>Don Cash Seaton, Safety In Sports, (New York: Prentice Hall, Inc., 1948), p. 132.



3. The school board should furnish sufficient funds for protective equipment, safe playing fields, safe bleachers, and suitable transportation so that the teams will not be forced to depend on the "gate" for these facilities and services.

#### Student Managers

If student managers are properly selected and trained, they may serve an extremely important role in the safety education program in varsity sports as aids in training. Different needs and types of programs among schools will make different duties for these managers. Seaton's<sup>7</sup> list of suggestions for student managers should cover most situations.

1. To assist in the daily inspection of play areas and equipment.
2. To instruct new students in all activities, especially in use of facilities.
3. To help supervise activities and assist in their safe performance.
4. To assist in the setting up and proper use and storage of equipment and supplies.
5. To conduct group safety from school to playground and back particularly when it is necessary to cross heavy traffic lanes.
6. To help develop and attitude of safety on the part of fellow students.
7. To learn the rules of the various games and to officiate well.
8. To learn first aid and how to report accidents.

#### Group Leadership

Group leadership calls for skill, insight, and understanding as well as amiability and kindness. The effectiveness of any

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<sup>7</sup>Ibid., pp. 141-143.

working group depends very much on the prevailing attitude and behavior of the leader. In order to have good group behavior we would want to have a group which has a common aim in which different individuals can make their own characteristic contribution and a group which has strong emotional bonds of affection and trust, whose members have a sense of oneness and belonging.<sup>8</sup>

Through group leadership "horse-play" can be kept to a minimum in your athletic program and a keener sense of safety responsibility can be established.

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<sup>8</sup>James L. Mursell, Psychology for Modern Education, (New York: W. W. Norton and Company, Inc., 1952), pp. 522-529.

### CHAPTER III

#### EQUIPMENT AND FACILITIES

In this part of the paper the writer has considered the general facilities and equipment for the sports mentioned in chapter five.

Adequate equipment is essential for safety in all sports. This factor is one of first consideration, for football especially. Often times high school teams are sent out to play football without proper equipment. This shows lack of common sense, or safety sense, on the part of some high schools concerning the type of equipment they furnish their teams.

Lloyd<sup>9</sup> says equipment hazards account for 20 per cent of the high school accidents and 10 per cent of the total days lost. Being struck by a piece of playing equipment is the most frequent cause of such accidents (42 per cent), followed in order by collision with other objects such as benches on side line (25 per cent), slippery surfaces, particularly gymnasium floors (14 per cent), tripping over extraneous objects on the playing areas (5 per cent), uneven playing surfaces (4 per cent), improper personal equipment (4 per cent), and too restricted a playing area resulting in overcrowding (1 per cent).

All high school sports should be played on smooth surfaces except cross-country and golf. In cross-country the path of the course, however, must be clear of debris and irregularities. In golf the fairways should be free from holes or other depressions.

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<sup>9</sup>Lloyd, Deaver, and Eastwood, op. cit., pp. 35-36.

Under no circumstances should the football field have stones, hard surfaces, or holes in the playing field. Obstructions should be well back from the boundary lines. The gym floor should be kept clean, not allowed to become slippery, and playing areas should be free for several feet from dangerous obstructions such as posts, walls, stairways, bleachers, drinking fountains and tables. All safety precautions should be observed just as faithfully during practice sessions as during regular games.

Forsythe<sup>10</sup> says generally there are between four or five times as many opportunities for accidents during practice as during games.

Lloyd<sup>11</sup> lists the following equipment and facilities as safety measures:

1. Regular inspection of equipment.
2. Level playing fields.
3. Properly lighted locker and shower rooms.
4. Use of non-slippery covering on locker and shower room floors.
5. Proper placement of mats.
6. Use the best possible equipment.
7. Board walks on shower room floor.
8. Rubber mats on locker room floor.

Forsythe<sup>12</sup> has the following to say about facilities. The size of the playing areas for various games is well defined in the official rules books. In most cases, however, certain sports may be played under better conditions if more than minimum

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<sup>10</sup>Charles E. Forsythe, Administration of High School Athletics, Third Edition, (New York: Prentice Hall, Inc., 1954), p. 282.

<sup>11</sup>Lloyd, Deaver, and Eastwood, op. cit., pp. 40-41.

<sup>12</sup>Charles E. Forsythe, op. cit., pp. 315-338.

requirements in space are available. It is desirable to allow for extra space than minimum rule books recommendations. This also will make play safer because it will allow for the layout of the playing area so that the out-of-bounds are safe distances from walls or other obstructions.

Once the indoor facilities have been built, it is necessary to use the space as it is provided. Care should be taken to remove all possible hazards.

The football field should extend north and south so that punt and pass receivers do not have to face a late afternoon sun. Since drainage of the field is of most importance, a gravel subsoil is the best base. The field should have 8 to 12 inches of loam topsoil and then should be sodded. The center of the field should be about a foot higher than the side lines.

The baseball diamond should not be a part of the football field, especially if the track circles the football field. Both track and baseball are spring sports and it would be safer to have them separate.

The track usually encircles the football field. The curb should be rounded on top and only two inches above the level of the ground. Fine, hard cinders should make up the top surface. The writer believes that runways and pits should be located outside or away from the football field if the track encircles the field. This will help prevent injuries to football players during the football season and also give adequate space to track participants utilizing the football field for warm-up exercises.

## CHAPTER IV

### PARTICIPANT SAFETY CONTROLS

In addition to controls that have been reviewed, consideration must be given to player safety controls. If those who participate in sports activities would utilize available information on player safety controls, the accidents and injuries that now result would be greatly reduced.

The player safety controls are to be set up in the following areas:

1. Health examination.
2. Adequate training.
3. Competition.
4. Reserves.
5. Warm-up
6. Officiating.
7. Transportation.

#### Health Examinations

Most coaches agree that such an examination is a primary safety control and should be required of all members of inter-school teams before participation in each sport. It is required in Illinois. The examining doctor or doctors should be familiar with the physical requirements of each sport, to enable them to eliminate those students who have conditions which might prove dangerous in a specific sport.

Seaton<sup>13</sup> found that the accident incidence for schools having health examinations was 11.6 per 1000 exposures as compared with 17.4 per 1000 for schools not having such examinations, a 39 per cent lower incidence.

Seaton<sup>14</sup> says the health examination should include items that affect a person's safety, such as color blindness, range of peripheral vision; other things that should be checked are the heart, blood pressure, hernia, nose, throat, hearing, and reaction time.

Participants absent from school for three or more days because of illness or injury should present a physicians written approval before they are allowed to play again.

### Training

Adequate conditioning is a phase of safety in sports. Good coaches always insist on members of their teams being in good physical condition. Coaches should set up training and conditioning schedules for boys in each sport that will insure their proper condition to compete.

Lloyd<sup>15</sup> reports 13 per cent of high school accidents are due to poor conditioning of the athlete.

Forsythe<sup>16</sup> says the reaction between injury and fatigue is more than assumption. A boy is less able to perform normal

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<sup>13</sup>Seaton, op. cit., p. 86.

<sup>14</sup>Ibid., pp. 87-89.

<sup>15</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 135.

<sup>16</sup>Forsythe, op. cit., p. 282.

functions when he is tired. It is only logical, then, that injuries are more apt to occur when he is fatigued. As a safety measure, therefore, it is essential that boys be in the best possible physical condition and go through an adequate training routine before they are allowed to compete in sports.

The player's training schedule is not the only thing of which a coach has to think. The player's health habits, such as eating a balanced diet and getting sufficient sleep throughout the remaining hours are also involved. The condition in which each individual reports for the team and the time required to get into condition presents a major teaching challenge to the coach.

Each sport requires a type of condition different from the other. The player who is in perfect condition for football is not able to step on the basketball court and last out a full game. Nor is the basketball player in condition for track events. There is only a partial carry-over; new skills must be established, and the cardiovascular system adjusted to the different types of endurance and power required. The coach who succeeds in bringing all participants to a maximum stage of condition in the shortest length of time with the fewest injuries and illnesses is the one most likely to be rewarded with success.

Some state associations have set up minimum training periods in some sports. In Illinois a football boy must participate a minimum of ninety minutes of actual field practice on each of fourteen days (excluding Sundays) preceding the first game.<sup>17</sup>

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<sup>17</sup>Illinois High School Association Official Handbook, (Chicago, Illinois, 1960-1961), p. 26.



### Competition

A safety precaution of importance is the policy of providing as nearly equitable competition as is possible in all sports contests. Specifically, this means that the scheduling of games between large and small teams is generally undesirable. This observation applies especially to contact sports. Schools invite criticism if those with large squads schedule games with others incomparable in size, and vice versa, especially if injuries occur in such games. It is wise to limit a school's athletic competition to other schools relatively comparable in size.

Forsythe<sup>18</sup> says equitable competition is one more safety precaution to which schools are beginning to give more attention than they did a few years ago, and the results are justified.

### Reserves

There is no set rule as to how many reserve players are necessary for each sport. Individuals capacities and abilities of boys vary, as do also the policies of different coaches in the use of reserve players. It is reasonable to assume that, in general, there should be at least two members on the squad for each position on the team. A great many schools do not attain even this minimum number of players. When this is the case, grave doubt may be raised as to the advisability of conducting the activity, especially in football and basketball.

Forsythe<sup>19</sup> says there is a definite relation between extreme fatigue and the possibility of injury. If a boy becomes tired,

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<sup>18</sup>Forsythe, op. cit., p. 284.

<sup>19</sup>Ibid., p. 283.

or is not in proper condition to play, he should not be in the game. His physical safety and health are endangered under such circumstances. One should be especially careful of boys after serious or prolonged illnesses. The best insurance against too much competition, which is likely to result in injuries or harm to a boy, is to have a sufficient number of reserves available and then not hesitating to use them.

#### Warm-up

Almost all coaches have pet theories about the proper method of warming-up for the various sports. The requirements of warming-up varies with sports, and even for events or positions within sports. Also, it will vary among individuals.

Seaton<sup>20</sup> says there are very few sports that do not require a good warm-up if injury is to be avoided and if maximum efficiency is to be attained. A carefully worked out system of warming-up should be developed by each athlete to fit what he has found by experience to be his particular needs. In general, this should be a gradually increasing set of activities which should increase the heart rate, not too much at a time, until he feels himself at a peak. At the peak of warming-up, a man should feel himself begin to sweat slightly provided he is warmly clothed, and should feel a definite increase in his muscular efficiency.

#### Officiating

The way the officials handle a game is also an important safety factor. Officials must know the rules, be alert physically

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<sup>20</sup>Seaton, op. cit., p. 138.

and mentally, and through their handling of the contest, keep it under control at all times. While the play is in progress, the boys actually are under their care, especially in a high school game.

Lloyd<sup>21</sup> says of the 31 per cent of all accidents in athletics caused by improper leadership controls, officiating is a cause of 44 per cent of these accidents.

Forsythe<sup>22</sup> says good coaches usually are in agreement that an official should handle a game in football or basketball so that the physical welfare of contestants has been protected.

#### Transportation

Forsythe<sup>23</sup> says transportation of athletic teams is another item that should receive safety attention.

Common carriers or school buses are recommended. In themselves they provide lessons in safety because of the unusual safety precautions of practically all drivers of such vehicles. Members of athletic teams should be cautioned regarding adherence to safety regulations and common courtesies. Definite discipline rules, should be in effect while enroute to and from schools for games.

If students travel from school to the practice field in private cars, insist that the number of passengers carried is not in excess of the intended capacity of the car. The ideal arrangement where a transportation problem of this kind exists, is to use a

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<sup>21</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 36.

<sup>22</sup>Forsythe, op. cit., p. 283.

<sup>23</sup>Ibid., p. 200.

common carrier or a school bus.

Under no circumstances should student drivers of private cars be allowed to transport teams to and from games. Where such a policy is followed, school authorities may be charged with negligence in case of accidents, with subsequent court action a possibility.

CHAPTER V  
INDIVIDUAL SPORTS SAFETY

Football

In so strenuous a sport as football, accidents and injuries to the players are inevitable. However, many of these injuries could be prevented by certain safety suggestions that will help prevent injuries.

Seaton<sup>24</sup> found in the combined high school and college studies that 31 per cent of all football accidents can be eliminated or materially reduced by adequate leadership, equipment and facilities, while the remaining 69 per cent are due to the present nature of the game.

Seaton<sup>25</sup> says if the following procedures are in vogue, in college and high school the number of accidents and days lost per 1000 exposures will be lowered.

1. Three years or more of playing experience by the head coach.
2. Nine years or more of coaching experience by the head coach.
3. Employment of football coach for football and some other sport.
4. Six to eight days of pre-season training before the first squad scrimmage.
5. An average of not more than thirty minutes devoted to football scrimmage each day.
6. A medical examination given before or during the pre-season training.

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<sup>24</sup>Seaton, op. cit., p. 63.

<sup>25</sup>Ibid., p. 65.

Forsythe<sup>26</sup> lists the following football safety suggestions:

1. Use only slaked lime or other non-injurious substances for field marking.
2. Insist on properly fitting equipment, especially pads, helmets and shoes.
3. Keep field in good condition--sodded, level and free from stones.
4. Be sure that substitutes are warmed-up before they enter games.
5. Keep substitutes seated on benches.
6. Keep chairs, substitutes' benches, extra equipment and band instruments 5 to 10 yards from side and end lines.
7. Use flexible staff goal-line flags.
8. Provide sweaters or jackets for substitutes.
9. Require that helmets be worn during all scrimmages and games.
10. Team members should be thoroughly warmed-up before the start of each half.
11. Keep spectators off the field during practice sessions.
12. Immediate medical attention should be given to all injuries and infections. Instruct players to report injuries at once.
13. Do not allow a boy who has been injured to practice or play until permission is received from the physician in charge of his case.
14. Remove fatigued and injured players from game.
15. Conduct well-organized and well-supervised practice sessions.
16. Check weights of squad members daily if possible.
17. Use tackling dummy instead of "live bait" in tackling.
18. Plan yard-line markers a safe distance from side lines.

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<sup>26</sup>Forsythe, op. cit., p. 289.

Dr. Floyd Eastwood of Los Angeles State College, head of a committee on injuries and fatalities which reports to the coaches association says that 72 per cent of the fatalities in football come from head injuries. He states that there has been a steady increase year by year in fatalities from blows on the head, and believes that further improvements in the helmet seem to be necessary.<sup>27</sup>

We have certainly got to find out whether any weakness in equipment or in training can be overcome so we can better protect these youngsters. The death toll this past year was over 25.<sup>28</sup>

Athletic Director Forest Evahevski<sup>29</sup> of Iowa, says the protruding face guards of football helmets are a possible cause for mounting football injuries and fatalities this past season. He thinks nose guards on helmets today might attribute to the cause of injuries and that possibly too much attention is being given to protection of the nose and teeth. He states:

With that protruding bar, it's like putting seat belts in an auto and saying: 'now go ahead and drive as fast as you want'. The head is not meant to be placed in a meatgrinder. I think players feel that with that bumper in front of their faces they can stick their heads into heavy traffic. I've heard that boys even have been told: 'go ahead and stick your face into your opponent's chest and we'll polish off the rest.'

I wonder if equipment now used is making players more reckless. In the old days, players were taught how to position their heads in blocking and tackling to ease the jarring effect and prevent injuries. It might be well today to turn a critical eye on how kids are positioning their heads.

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<sup>27</sup>Decatur Herald, (Decatur, Illinois: October 12, 1961), p. 14.

<sup>28</sup>Ibid., p. 14.

<sup>29</sup>Decatur Herald, (Decatur, Illinois: October 30, 1961), p. 14.

Woody Hayes<sup>30</sup> has recommended adoption by the NCAA rules committee of a foam rubber covering for plastic football helmets as an added safeguard against injuries.

Dr. Allan J. Ryan,<sup>31</sup> a member of the American Medical Association's Committee on the Medical Aspects of Sports, told rules officials that sportsmanship enters into the athletic injury picture because in course of time situations develop which are not anticipated when the original rules were laid down.

Changing styles of offensive and defensive play do tend to outmode some rules, and Dr. Ryan<sup>32</sup> listed these changes as having increased the injury potential:

1. The advent of "T" formation which revolutionized offensive line play.
2. Increasing use of forward pass and the defensive response of "red-dogging", or rushing the passer.
3. The shift to allow blocking with one arm held horizontally away from the shoulder. This makes the elbow and the forearm a formidable weapon.
4. The trap play, designed deliberately to hit the onrushing defensive player from the side when he is not prepared for it.

Two practices were deplored by Dr. Ryan<sup>33</sup> who said they are being reintroduced by certain coaches who like to see play a little more rugged but are not perhaps aware of the extent to which the injury potential is increases. These practices are:

1. Gangtackling, where four or five tacklers try to land on the ball-carrier simultaneously.

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<sup>30</sup>Decatur Herald, (Decatur, Illinois: October 31, 1961), p. 18.

<sup>31</sup>Decatur Herald, (Decatur, Illinois: January 14, 1962), p. 22.

<sup>32</sup>Ibid., p. 22.

<sup>33</sup>Ibid., p. 22.



2. "Spear" tackling or driving the head into the ball, chest or up under the chin. Both the head and chest are subjected to a severe and unnecessary strain.

The National Safety Council<sup>34</sup> lists the following safety suggestions:

1. An estimated 650,000 high school players, and 70,000 college boys play the game of football each fall, plus uncounted thousands on the sandlot level.
2. In the past 24 study years, some 545 deaths have been attributed, directly or indirectly, to non-professional football, an average of approximately 23 per year. Of these, 316 occurred in high school, 167 occurred on the sandlot, and the remainder in college football.
3. Tackling, blocking, and being tackled or blocked accounted for 54.4 per cent of all fatalities from 1931-1955.
4. The most dangerous time for a player was the first five minutes after he entered the game. The most dangerous period of the game was the fourth period.
5. In a study made on Wisconsin football, only 30 per cent of all play occurred within the 20-yard lines, yet 65 per cent of all injuries occurred there.
6. Of the fatalities directly attributed to football, half were due to head injuries.
7. More than one-third of direct deaths are in the second, third and fourth weeks of October; only three-tenths occur in preceding weeks.
8. The standard, heart-lung-blood pressure type of physical examination should be replaced by a thorough, detailed analysis of the physical condition of the candidate. Each boy then would receive such important tests as X-rays of any past injuries, electrocardiograms if there is any suspicion of heart trouble, and a urinalysis.
9. No boy with any history of heart abnormality should be permitted to play football.

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<sup>34</sup> National Safety Council, Safety in Sports: Football, (Chicago, Illinois, Copyright, 1956), data sheet number 72.

10. In addition to a background of football fundamentals, the coach should be thoroughly familiar with physiology, kinesiology, psychology and related fields; he must know the physical and mental makeup of the age group he is handling.
11. The football coach should have had considerable playing experience before taking over as a coach. Coaches who lack this experience tend to underestimate the dangers of the game and experience higher accident rates.
12. The opponent should be chosen whose playing standards and quality of personnel are approximately the same.
13. Close family-administration-coach relations should be established to relay information as to the boy's condition and attitude away from the field of practice and play. Parents should be apprised of training rules so that they can help the boy go through the season without breaking training. A desirable method of apprising parents of training rules is by getting a written permit from them letting boys play. On the permit should be a list of rules that parents can see, and promise to help the boy keep.
14. It is suggested that an open date, occurring during the second week in October, be adopted as standard practice. This will allow a mid-season checkup to take place and give players the opportunity to recover from minor injuries that otherwise could become major ones.
15. Close officiating in those rules that are designed to promote the safety of the player, and the use of the "quick whistle" to prevent pileups on line plays marks the qualified official.
16. It is most satisfactory if freshmen play against freshmen, sophomores against sophomores, and junior varsity should scrimmage and play with the junior varsity squads of other schools rather than scrimmage against the varsity.
17. In no other sport does adequate equipment play such a vital role. The greatest deterrent to accidents and injury in football is to use only the best protection.

18. Many states have a state athletic association which makes recommendations and sets requirements on types of equipment, length of practice, date practice should start, etc. These recommendations and requirements should be studied, not only because following them insures greater safety but also because in some states schools are barred from competition if state association requirements are not fulfilled.
19. More than any one thing, the helmet should provide a method of holding the skull away from the shell on impact. There should be at least one inch of clearance between the outer shell and the nylon or canvas webbing into which the head fits. The helmet should be lined with vinyl plastic, which is 15 times more shock absorbent than foam rubber.
20. Audibility in a helmet, as well as protection, must be considered to offset the chance of accident due to a missed signal.
21. Old helmets should be discarded, certainly never passed down. Perspiration and wear play havoc with the all-important inner lining, especially around ears, forehead, temple.
22. The helmet must fit the individual it is to protect. The back of the head and base of the skull must be covered; it must not fall forward over eyes; it must not turn on contact.
23. The objectionable feature of the plastic helmet-- that it is a rock-hard offensive weapon when used for that purpose--is offset by the almost total disappearance of a brain concussion when and where it is used.
24. Nose and eye guards attached to the helmet have proven satisfactory protection against facial damage, but they may cause injury to a heedless opponent. Investigate use of face masks.
25. Colorful uniforms must not be obtained at the sacrifice of safety. The safety the uniform provides should remain the paramount consideration when outfitting the player.
26. Properly fitted, full-weight shoulder, hip, thigh and knee pads should be provided. The cantilever arrangement is a standard feature of the good shoulder pad.

27. One easily controlled menace concerns the use of the mouthpiece. A relatively inexpensive piece of equipment, the mouthpiece will reduce oral damage considerably and provide a cushion necessary to help prevent concussion from the shock of blows sustained by the head and chin.
28. The shoe should provide good lateral support for the ankle and should be equipped with the safety cleat. The locking device on the safety cleat prevents it from chipping, backing off, and exposing either the sharp edge of the cleat itself or the metal post to which it is attached.
29. Shoes should be kept in good repair and constantly checked for broken counters and tears of any kind that could possibly cause blisters to form. They should be weatherproofed to keep the leather in the best possible condition during wet weather.
30. Stockings should be worn to protect the lower leg from lacerations and infection.
31. In light of the overwhelming evidence of the importance of proper equipment, the practice of handing down equipment from the varsity to other squads should be discouraged.
32. Hard, rainsoaked or torn dummies should be either repaired or discarded. The charging sled is a better and safer way of teaching the fundamentals of blocking than the use of live players.
33. Players should be taught to use ankle wraps, or ankles should be taped before playing.
34. Additional emphasis needs to be put on proper warm-up before the drill work of the practice session begins.
35. The entire area of the practice field should be utilized in planning the organization of the day's work. Avoid the possibility of blind collisions by individuals practicing different skills by scattering the units as much as possible.
36. The squad should be impressed with the importance of absolute obedience to the whistle. In all work-outs, the "quick" whistle should be employed by the coaching staff.
37. Close supervision of every element of the practice session is doubly important during the first weeks of practice. No horseplay should be tolerated.

38. All spectators should be confined to the bleachers. During scrimmage sessions, those players not in action should be along the sidelines, well out of the way of possible injury.
39. In practice sessions, freshmen and sophomores should be grouped together, and juniors and seniors together. Then, if possible, the players should be balanced out against others of equal size and weight, in their own age group. Abnormal age and size differential puts a needless risk on the smaller, or younger boy.
40. Close officiating is as important a safety factor in practice scrimmages as in the game.
41. A competent team trainer should be in attendance at all practice sessions, and a doctor should be on call during that time.
42. Statistics show that most injuries occur in blocking, tackling, and in being tackled. Mastery of these fundamental football techniques should be the primary concern of the coach and his staff. They should be consistently practiced throughout the season.
43. Special attention should be directed to the technique of falling
44. Sufficient reserve strength is an essential for a good team, but it is a greater essential for safety. Tired players should be given a rest.
45. There should be no squad scrimmages until at least a week of practice is completed. For the contact skills, enough time should elapse to allow the participants to get into condition.
46. Care must be taken to keep the players warmed up by a constant and varied program of activity during the practice.
47. The use of "live bait" for blocking and tackling dummies should be used, lightly at first, and with slowly increasing intensity.
48. When "live bait" is used, the possibilities of the new blocking aprons as additional protection should be investigated.
49. Definite practice plans and adherence to a pre-set time limit on each phase of the day's workout will sustain alertness and minimize injuries that occur through carelessness and inattentiveness.

50. Thorough warm-up periods should precede the opening kick-off of each half. A warm-up period before sending in a substitute should be mandatory.
51. Any injury that causes momentary blackout is sufficiently serious to warrant the immediate attention of a doctor.
52. Stretchers should be available at every game. Fatal hemorrhages have occurred when a player has further exerted himself to walk off the field, and what might have otherwise been a relatively easy injury to overcome has been magnified by the stress of forced movement.
53. Every concussion should be X-rayed at the first opportunity and studied with the encephalogram.
54. A serious brain concussion should eliminate the player from all further consideration as a football candidate.
55. Whether a player should be allowed to return to the game after sustaining injury should be governed solely by his doctor, and not on a coach's or trainer's opinion.
56. Chain men should be instructed in the proper protective procedure when a play ends up in their territory.
57. The playing field should be level and well-drained, with a good stand of grass. This area should be watered frequently during the summer to expedite building a sound turf.
58. A five-yard safety zone for the players should extend around the field itself, free of all obstructions.
59. The sideline markers should be made of a flexible material, preferably rubber.
60. The goal posts should be padded to a height beyond the chance of collision.
61. Great care should be exercised to assure that the surface is free of holes, ruts, stones, broken glass, and other dangerous objects.
62. The players' benches should be set well back of the sidelines, and equipment should be confined to an area behind the bench.

63. A restraining fence to keep spectators off the field should surround the area.
64. Only slaked lime should be used to mark the lines.
65. As a preventive measure **against** possible lockjaw, animal excreta should never be used as a fertilizer in building turf.

### Basketball

Coaching and playing according to the spirit of the game rather than only the rules, and more efficient officiating, should eliminate many accidents. The play area, particularly in high schools, is often too small, with insufficient clearance space along the side and end lines, and in some cases, pillars may be found in the playing area itself. If the area is limited in size, the walls and other dangerous places should be padded. There should be at least four to six feet between the court and wall or bleachers. The floor should be kept clean and should not be slippery.

Lloyd<sup>35</sup> states the following causes constitute 61 per cent of the injuries in high school basketball. Colliding with other players, being struck by playing equipment, collision with extraneous objects, slipping on the floor, twisting an ankle or knee, unnecessary roughness, poor physical condition, improper personal equipment, and tripping over play equipment, are in order of rank.

Foot blisters are often the bane of a basketball coach's existence. Special precautions must be taken if they are to be prevented among players. Shoes are probably the most vital equipment of the player, in so far as safety is concerned.

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<sup>35</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 86.

Only the finest quality should be provided for players. Playing in street shoes or stocking feet is dangerous and should never be permitted. The proper fitting of shoes is of extreme importance as is early season practice to toughen the players feet for the season.

Seaton<sup>36</sup> says two pairs of socks should be worn, the inner pair of cotton, preferably of light weight, such as track socks, the outer pair of best quality heavy wool. Feet can be hardened by painting them with skin-toughening compound and dusting with zinc stearate before and after practice. Socks should be changed daily, especially during early season training when the above processes are in vogue.

Forsythe<sup>37</sup> lists the following basketball safety suggestions:

1. Be sure of proper conditioning of all players.
2. Practice sessions should be well supervised and of not too great length.
3. Have a smooth, clean, but not slippery floor.
4. Posts, player's benches, scoring tables, bleachers, and the like should be removed as far as possible from playing area.
5. Give immediate attention to all injuries and infections. Report them immediately to a physician.
6. Keep all substitutes seated on benches.
7. Have ample space at the end of court between end line and bleachers or wall.
8. Have first-aid kit on hand at all games and practice sessions.
9. Allow no injured players to participate in practice or games.

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<sup>36</sup>Seaton, op. cit., p. 264.

<sup>37</sup>Forsythe, op. cit., p. 288.



10. Check on proper equipment, especially shoes.
11. Keep players warm prior to participation.
12. Make frequent substitutions and instruct teams to take allowed rest periods.

The National Safety Council<sup>38</sup> lists the following safety suggestions:

1. The suggested high school playing floor size of 84 by 50 feet, with six feet of clearance at the end lines and three feet clearance along the sidelines, is a minimum standard in new construction or when remodeling.
2. Gymnasiums with endlines that are close to the wall, with permanent bleachers, stair wells and permanent apparatus equipment should be checked for dangerous corners and protruding equipment. Such places should be adequately covered with plastic or canvas checkmats.
3. The lighting should satisfy the basic gymnasium specifications and be of equal intensity at all spots on the playing floor.
4. With large numbers of players in varsity and reserve squads, intramural teams and physical education classes, the rollaway bleacher is preferable to the permanent bleacher arrangement at floor level. The cross-courts thus made available and the large playing area thus exposed will lessen the chances of accident.
5. All wall attachments should be recessed.
6. Foot mats, for cleaning and drying the shoes, placed at the points of entry into the gymnasium, will help keep the playing floor clean and assure better footing for the players.
7. Loose gymnasium apparatus should be stored well out of the way before a practice or a game begins.
8. Construct racks for the basketballs not in use. In drill and scrimmage work, get the loose basketballs up off the floor and out of the way.
9. A telephone should be in the immediate area of the playing floor or locker room.

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<sup>38</sup>National Safety Council, Safety in Sports: Basketball, (Chicago, Illinois, Copyright, 1957), data sheet number 77.

10. Backstop supports should be so arranged as to give plenty of room to the players beneath the basket. Supports directly to the wall behind the basket, or supports suspended from the overhead are preferable.
11. The timer and scorekeeping bench should be included as a part of the bleacher arrangement, not put in close proximity to the playing floor itself.
12. Observe the usual fire precautions that rule areas containing large numbers of people. The local fire department will gladly assist in setting up specific suggestions for safety in each situation.
13. Shower and locker room floors that afford traction even when wet indicate safety consciousness. Recessed handles, recessed soap dispensers, and an adequate number of shower heads to prevent crowding are essential to the planning of safe units.
14. When crosscourts are used, the wall should be padded for at least ten feet on both sides directly beneath the basket. If floor level folding bleachers are used, arrangements should be made to hand the checkmat in position.
15. Portable basketball courts need greater extension of free space beyond the playing court proper because of the step-off danger.
16. Door handles near play area should be recessed.
17. Doors should not open directly onto the play areas, and exits must open outward.
18. The gymnasium will be a safer place in which to play if the area is soundproofed. Poor acoustics result in reverberations which in turn cause confusion.
19. Floors must provide a resilient, non-slip surface.
20. Constant supervision of the squad by the coach is essential. Neither in the locker room nor on the floor should horseplay be permitted. If for any reason the coach should be called out, the team captain or someone responsible should be left in charge.
21. The first aid kit should be available to the coach on the floor. A complete line of supplies and a thorough knowledge of the correct administering of first aid is essential to safety.

22. The first aid room should be completely stocked with first aid equipment, and posters depicting what to do in case of common emergencies should be prominently displayed.
23. A doctor should be on call during practice sessions and present during contests.
24. Lockers and locker rooms should be so arranged as to permit frequent and easy cleaning. Floors should be disinfected daily.
25. Whether to tape and wrap ankles is a controversial subject. However, if a general rule is desired, ankle strengthening exercises should be made a part of regular warm-up and practice routine, and those with known weak ankles should have them wrapped before action.
26. A system of issuing clean towels, clean athletic supporters and clean socks will lessen chances of injury and infection to the participants. All boys should be issued a shirt of their own for practice.
27. A procedure should be standardized for a complete physical and dental checkup before a season opens, preferably by the family physician; again at the midpoint of the season; and after the season is over.
28. Keep a complete health record on each player.
29. Before the season opens, come to a complete understanding with the squad on the elements of the basic training rules. Since good physical condition is an absolute essential to the game of basketball, and in light of the fact that accidents are likely to happen most frequently when the player is in a state of partial fatigue, insist on the observance of those rules that will lead to top physical condition. Be sure parents also understand and agree to training rules.
30. After an illness or an accident, secure the doctor's and parent's permission before allowing the athlete to resume playing and practicing.
31. Check the physical condition of the players following each game. Players should take plenty of time in settling down to mental and physical normality following each game, and before proceeding home.

32. Inclement weather is the rule rather than the exception during the basketball season. Warm clothing, scarves, head covering and overshoes, when necessary, should be standard personal equipment to help ward off the illnesses that can easily afflict players inadequately clothed and fatigued after a hard game.
33. Excessive perspiration upsets the saline balance of the body and the brain. Following a hard workout, stabilize this balance by taking a salt tablet with a glass of water.
34. No boy with a record of heart abnormalities should be allowed to play the game.
35. The correct execution of the fundamentals of the game is a reliable safety measure. They should be properly performed and consistently practiced throughout the season.
36. Regular attendance at the practice sessions should be mandatory.
37. Conditioning drills should play a prominent part in early season planning. The workouts should be designed to promote players in condition to go the full length of the ball game at peak efficiency.
38. To lessen the chance of a crippling blister, especially in early season workouts, the soles of the feet should be painted with benzoin and then liberally powdered to reduce friction.
39. An inner sock of light cotton should be worn underneath the wool sock.
40. Shoes specifically designed for basketball are preferable to any other type. There should be about one-half inch at the tip for clearance on the sudden stops and pivots common to basketball. The shoe should feature a non-slip sole, and shock-absorber properties under the heel and the transverse arch of the foot. The shoe must afford adequate ventilation. The properly fitted shoe is the most important personal item of the basketball player.
41. Trunks should be equipped with light hip pads.
42. Safety lenses only should be used by players needing glasses. Ordinary lenses are hazards in the fast moving game of basketball. Glasses should be secured by tape or a rubber band. All jewelry should be removed when playing.

43. During hard practice sessions, especially in early season workouts, supply frequent rest periods. This maintains a higher level of alertness during the work itself, and lessens the fatigue factor as an accident possibility.
44. Individual towels for the players prevents passing disease germs among squad members. Discourage the one-towel habit.
45. Provide cool (about 50° F) drinking water from sanitary paper cups, if there is no fountain immediately available to the floor.
46. On trips, travel by buses in one unit, if possible. Use only qualified drivers. Everyone rides on the bus with no exceptions; both to the game and home after the game. Insist on proper personal conduct. (See Safety Education Data Sheet--Number 11, School Buses, and Number 13, Passenger Safety in Public Carriers).
47. The officials must be competent, familiar with the game and its rules, and be conscientious about the safety of the players in handling the play situations. Only registered officials should be used.
48. Insist and give adequate warm-up time before beginning the contest or practice session. About 20 or 30 minutes should be adequate.
49. Custodians should be present, or arrangements made to clean the floor between halves and before main and preliminary games.
50. No pop bottles should be allowed in the gymnasiums. Restrictions should be made to minimize dangers of other concession stand hazards.
51. All tape jobs should be inspected at half-time for tears or loosening up, and additional support provided if necessary.
52. The greatest single danger, statistically, is infection from untreated skin ruptures. All injuries, abrasions, and floor burns should be reported and treated immediately.

#### Track and Field

Track and field athletics are among the less hazardous sports activities. However, many potential trouble areas could develop if proper planning and maintenance are not observed.

The surface and curbs of the running track, the location of the field event areas, the substance used in the jumping pits to cushion athletes' falls - all of these call for careful supervision.

There are no available statistice on the number of injuries which occur each track and field season as a result of poor physical conditions. Also, it is not possible to tell how severe such injuries may be. Yet almost everyone who has followed the sport can recite instances where athletes have been unnecessarily injured.

Although there are no accurate statistics, a greater number of accidents happen during practice sessions.<sup>39</sup> In addition, track coaches claim that more accidents occur indoors than outdoors, which they attribute to the crowded conditions.

Seaton<sup>40</sup> says more than 80 per cent of track and field injuries occur to the leg and foot, arm and hand.

Coach Bresnahan<sup>41</sup> of Iowa feels a boy can compete safely in four events, such as the high jump, broad jump, shot put, and 100 yard dash. Coach Homer Allen<sup>42</sup> of Purdue believes that it depends upon the competition and the number of heats to be run.

The weight events implements should be used only under supervision and in designated and protected areas. All boys in these events should be shown the proper way of throwing the weight.

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<sup>39</sup>Seaton, op. cit., p. 359.

<sup>40</sup>Ibid., p. 362.

<sup>41</sup>Ibid., p. 363.

<sup>42</sup>Ibid., p. 363.

Improper form is one of the reasons for injuries in the weights. Never let a boy throw his best until he has had several days of practice, then warm up properly before trying for distance.

In the running races starting should not be undertaken until at least two weeks of practice.

The landing pits are very important in the jumping events. Lloyd<sup>43</sup> states that 67 per cent of the injuries in the jumping events were found due to improper landing in jumping pits, either because of lack of skill or because of improperly constructed landing pits.

These pits should be of sufficient area. The high-jumping pit should be at least 16 feet wide and 12 feet long. The vaulting pit at least 16 feet wide and 12 feet long. The broad-jumping pit at least 9 feet wide and 15 feet long, with the take-off board about 12 feet away from the pit. The pits in the high-jump and pole vault should be raised. The runways for the jumping events should be kept smooth. The take-off board in the broad jump should be level, and the surrounding ground flush with the board.

A number of injuries are reported in track due to overcrowding, particularly at the turns, resulting in tripping and spiking. Some of these hazards can be reduced by reducing the number of competitors for each heat, stagger starts, use of alleys, and the posting of competent officials at all times.

Spectators, coaches, and competitors (except when they are competing or warming-up) should be kept off the track and field during meets. This is one of the hardest tasks, especially in

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<sup>43</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 115.

many high schools, when they have no fences. During meets as many areas of the field as possible should be roped off to prevent collisions and injuries from being struck by equipment.

Forsythe<sup>44</sup> lists the following safety suggestions for track and field:

1. Proper conditioning in cross-country and track is by far the most important safety consideration.
2. Be sure that contestants are thoroughly warmed up before they enter their events.
3. Limit the participation of each individual, as to number and type of events, in accordance with recommendations of best authorities on the subject.
4. Have a first-aid kit on hand at practice sessions and meets.
5. Keep spectators a safe distance away from track and field events, both at practice sessions and at meets. Keep discus and javelin areas roped off and allow no one in them.
6. Be sure the vaulting and jumping pits are so constructed that they provide a soft landing place for vaulters and jumpers. Keep them spaded constantly.
7. Give immediate attention to all injuries and infections. Report them to a physician.

The National Safety Council<sup>45</sup> lists the following safety suggestions for track and field.

1. The top surface of the track should be composed only of fine grained material--screened through  $\frac{1}{4}$  inch mesh--so that no runner will be exposed to the chance of stepping on loose or uneven ground and twisting an ankle. Also, if a runner falls on a fine surface, his skin will suffer much less than from a fall on coarse material.
2. The curbs on each side of the track should be about two inches above the track level, with rounded top surfaces and marked with a light-colored paint.

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<sup>44</sup>Forsythe, op. cit., p. 288.

<sup>45</sup>National Safety Council, Track and Field Events, (Chicago, Illinois: Copyright, 1959), Safety education data sheet No. 89.



3. Lanes should be at least 36 inches wide for the straightaway. A 30 inch lane could be used around turns when a staggered start is possible. However, for running the hurdles, a lane should be at least 42 inches wide for high school and 48 inches for college. These widths should be strictly enforced so that no runner could normally bump or strike another runner.
4. In races which are run around turns, every precaution should be taken to avoid possible congestion as runners enter the turn. Congestion can be avoided by: (a) staggering the start and having the runners maintain individual lanes around one turn and (b) starting a race in the middle of the straightaway, which would then leave 40 to 50 yards of straight running before entering the turn.
5. The rule governing "cutting-in" should be rigidly enforced so as to eliminate the danger from spiked shoes. (See Rule 23, "Changing of Course," The Official National Collegiate Athletic Association Track and Field Guide, 1962, P. O. Box 757, Grand Central Station, New York 17, N. Y.) This rule also applies to college racers.
6. In hurdles, only standard type hurdles should be used (see Rule 28 of above mentioned book). Immediately after use, the hurdles should be removed from the field and chained together.
7. Only contestants and officials should have access to the track.
8. Each field event area should be isolated from other field events and the track, so that no competitor will in any way interfere with another.
9. The runways should be well constructed with an even and smooth surface which will not become slippery when wet. There is a trend toward the construction of hard-top runways so that they will not become soft and slippery in rainy weather.
10. High jump pits should have a minimum of two feet depth filled with sawdust, shavings or a mixture of both. For pole vault pits, three feet depth of soft material is necessary. For broad jump pits, a minimum of 18 inches of fairly coarse sand is satisfactory. The pits should be constantly raked so that they remain resilient, level and loose.

11. The equipment used (poles, cross bars, etc.) should be made only of the best materials so that breakage during use will be at a minimum. Consult a reliable dealer for advice concerning good equipment. Do not buy "bargains". Good equipment costs more, but will last longer and is safer.
12. Shot-put and discus throw events should be carried on only in specially designated areas--fenced off or away from the general traffic. A log or other device should be used to stop all rolling shots or sliding discs.
13. Only contestants and officials should have access to the field.
14. Each contestant's physical fitness and health should be certified by a physician.
15. Each contestant should wear only well fitting and clean uniforms to insure free performance and to prevent infections.
16. Each contestant should be willing to assume the responsibility of doing nothing that might endanger himself or another contestant or an official.
17. Athletes should stop, look and listen while in warm-up sessions, in practice and during meets. Teammates some times start daydreaming while warming up and could unthinkingly walk in the way of a racer taking a fast break.
18. Contestants must be certain to go through a thorough warm-up period which will prepare their bodies for the strain and exertion of the practice or contest.
19. Each coach is responsible for providing first aid equipment for his team.
20. A list should be posted in every track dressing room which would include the coach's telephone number, the number of the team physician, and an ambulance service phone number.
21. The coach should have complete knowledge of how to have an athlete admitted to the nearest hospital. If the coach is not present at all workouts, the procedure should be posted in the dressing room. A delay in such cases could be serious.
22. Each official should know and strictly enforce the rules and regulations which apply to the particular event to which he is assigned. He must always act as an official, not as a spectator.

23. Spectators should be kept off the playing areas as a safeguard for the contestants as well as themselves. Use of a fence, if possible, is the best method to restrain. They should not stand under the grandstand or bleachers and should never throw anything onto the field.

The writer believes that all-weather surface tracks are the tracks of the future and will help alleviate injuries.

### Baseball

Baseball seems to be a comparatively safe sport. In fact, according to the National Safety Council<sup>46</sup>:

The accident incidence in baseball is low compared to other sports, and most of the injuries that do occur are of a non-serious nature. In spite of a loss in the number of participants in hardball, the increased interest in softball, the expansion of employee-relations programs in industry, and the advent of the "Little Leagues" has resulted in an over-all increase in players.

Lloyd<sup>47</sup> says the accident incidence in baseball is comparatively low, most of the accidents being of a non-serious nature. Some, however, are quite serious and should receive the attention of teachers of this sport. The three most frequently injured parts of the body which account for 96 per cent of the accidents are, in order of rank, the arm and hand, the leg and foot, and the head and neck.

Proper personal equipment is essential in this game, hip and thigh pads, spiked shoes and gloves for all the players and full equipment of mask, chest protector, shin guards and glove for catcher. The batter should always wear a protective helmet. All spectators should be kept a safe distance from the playing field.

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<sup>46</sup>National Safety Council, Safety in Sports: Baseball, (Chicago, Illinois: Copyright, 1956), Data sheet number 71.

<sup>47</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 107.

More adequate training in base sliding will help reduce accidents. Also, a smooth playing surface, mixing sand in the surface to permit soil to break away in the slide, will eliminate some accidents and reduce abrasions.

In the early season it is very important to instruct your players in properly warming up their arms. No boys should throw hard until they have had several hard practice sessions.

To avoid collision with players fielding the ball it is wise to designate a captain or some proper recipient for the infield, and outfielders to call out who should take the ball.

Stack and Elkow<sup>48</sup> says hazards may be reduced in the following practices are used:

1. Plastic "skull caps" when at bat.
2. Bats with nonslip grips of tape, cork or other material.
3. Smooth playing surfaces.
4. No spikes except for advanced players in competition.
5. Playing area and "on deck" area marked
6. Protected players' benches for those not at play.
7. Bats gripped firmly with dry hands to prevent slipping.
8. Masks and chest protectors for catchers.
9. A player should call for a fly ball to avoid collision.
10. Head first slide prohibited (except for those with "BAD" knees).
11. When sliding is permitted, players must wear sliding pads.

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<sup>48</sup>Stack and Elkow, op. cit., p. 84.

The National Safety Council<sup>49</sup> lists the following safety suggestions:

1. The arm and hand, leg and foot, and head and neck are the areas that account for 96 per cent of the injuries.
2. The leg and foot injuries are mainly due to spike shoes, the unevenness of the playing surface and sliding into the bases.
3. The head and neck injuries are mainly due to being struck by a thrown bat or ball and collisions with other players.
4. There are approximately 767,000 high school and 202,000 college players engaged in baseball each spring.
5. The size of the diamond should be adjusted to the game and the participating age group.
6. The infield should be skinned over an area large enough that most of the time the ball will be fielded over a smooth surface. Most good fields have grass infields with skinned base lines and back areas.
7. The diamond should be properly tiled and drained to help eliminate hazardous mud and surface problems.
8. Because permanent outdoor grandstands and bleachers are most likely to deteriorate, an engineer should inspect them before the opening of each season for spectator safety. For more information, see Safety Education Data Sheet No. 24, Places of Public Assembly--Grand-Stands, Bleachers and Auditoriums.
9. Demountable bleachers should be erected by reliable workmen who will follow the directions of the manufacturer.
10. Storage space should be provided for all movable equipment on the field.
11. A good play surface must have resilience, freedom from dust, be firm and smooth. This necessitates a program of constant care and supervision. Often the college or high school coach must supervise this program as groundskeepers are usually not available.

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<sup>49</sup>National Safety Council, op. cit., data sheet number 71.

12. The players' benches should be at least 30 feet from the home plate and the baselines, and be protected by a screen. Dugouts are preferable, if possible.
13. The bleachers on the first and third base lines should be padded to protect a player going for a high foul in that territory. All fixed equipment adjacent to the playing field should be padded in a like manner. Regulation filled, heavy canvas bases should be used, or single spiked bases for youngsters who do not know how to slide very well. Spectators should be protected by a wire screen placed behind home plate.
14. The home plate should be the standard rubber plate, set in at surface level.
15. Stakes used to tie the bases down should be buried below ground level.
16. The field should be clearly marked and lines established all the way to the fence. It should be enclosed and away from traffic. The marking would include a batter's box, catcher's box, coaching boxes along third and first base lines, and an "on deck" circle for the next pitcher.
17. Bleachers, a fence or a roped-off area should keep spectators off the field.
18. All players not at play, or in the "on deck" circle, should be confined to the bench.
19. Bull pens for warm-up should be provided in a place where they will not create a danger. Any warm-up equipment used by a waiting batter in lieu of a bat, such as an iron pipe, should be prohibited.
20. Lights that are erected for night ball should be at least 60 feet in height.
21. The light supports should be made of four-legged structural steel set in a base of concrete, and placed out of the playing field. If this is impossible, the support should be padded to a height of ten feet.
22. The basketface floodlight should be used to protect the light itself.
23. Rather than a set footcandle rating at ground level, the objective should be to achieve a light of even intensity all the way down in order to effectively judge a ball in flight.

24. The entire playing area should be free of any marked depressions.
25. Calcium chloride, or a product specifically designed for the purpose, should be used to settle the dust and compact the surface of the infield.
26. Slaked lime should be used for all markings. Unslaked lime can cause burns.
27. A backstop 32 feet high and 60 feet behind home plate will get 85 per cent of the foul tips.
28. Screening provisions should be made for spectator protection in the areas closest to the home plate.
29. Easily moved batting cages should be constructed to confine the area into which the ball will be hit during batting practices.
30. Coaches should be men trained in the fundamentals of the game and coaching and be well acquainted with child psychology and first aid procedures.
31. Since the serious injuries in baseball involve the head, the protective casing or plastic shell cap liner should be used, especially at bat.
32. Softball, utilizing the 12 or 14 inch smooth seam ball, is the game that should be used in the elementary grades and in physical education classes at all levels.
33. Bat handles should be taped or wrapped with a cork or sandpaper surface.
34. The baseball uniform is a safety measure. All players should be properly dressed to play the game. The spikes should be worn for surer footing; the long, heavy stockings, with long white inner stocking, for prevention of leg abrasions when sliding; the extra long knee pants with the reinforced knee cap to protect the knee joint, and sliding pads to protect the hip region and upper leg. Cup-type supporters should be worn at all times by catchers.
35. Spikes should not be used as part of the uniform in games more loosely organized as in physical education classes, or in the lower age groups. Rubber cleated shoes or sneakers are suggested for children below high school level.
36. The catcher should never be permitted behind the batter unless protected by the full catcher's equipment.

37. Sun glasses with unbreakable lenses should be provided the infielders and outfielders during daytime games, especially those players who must face the sun.
38. Gloves should be large, firm, and in good condition.
39. As in all sports, the fundamentals of the game should be thoroughly mastered and practiced throughout the season. A daily lesson plan is as important as bats and balls.
40. The batter should maintain a firm grip on the bat and keep his hands dry to prevent the bat from slipping during the swing. Have rosin bag or firm grip available.
41. The proper release of the bat after hitting the ball should be especially well learned. In elementary grades, the bat should be dropped on a mat, or in a designated area.
42. The batter should maintain balance and be alert at all times in order to be able to get out of the way of an inside or wild pitch.
43. The batter should assume a normal batting stance. Neither he nor the catcher should crowd the plate.
44. Batters should keep their eyes on the ball all the way into the hitting zone and take care never to turn the back on a pitched ball.
45. The bat should be held with the grain up to avoid breaking.
46. Excessive "digging in" at the plate will make the player less able to get out of the way of a bad pitch.
47. A bat rack should be provided to keep all the bats not in use up off the ground, and a manager appointed to see that this safety requirement is carried out.
48. After delivery, the pitcher should keep his gloved hand in front and be balanced and alert for line drives.
49. When tagging a runner, select a position that forces the runner to tag himself. The player should try to position himself so that the bag protects his feet.
50. A definite assignment as to who calls the turn on pop flies in the infield should be clearly understood by all players. The first player who calls, "I have it!" has first preference. This rule should be applied to the outfield also.



51. An infielder should never try for a fly ball that can be handled by an outfielder.
52. When a man has been designated as the one to try for the fly ball, all others vacate the immediate area.
53. The players should be in good physical condition, and not find themselves in a state of semi-exhaustion the following day.
54. Detailed sight and reflex information should be a part of a baseball player's physical examination prior to the season, to determine ability to bat and field the ball. Blood pressure and possible hernias are also very important to know about.
55. Sawdust and sandpits should be utilized in teaching the proper fundamentals of sliding. The improperly executed slide is one of the most dangerous of the baseball skills. Form and proper take-off can be practiced on mats before going out-of-doors.
56. A player advancing into a base who has decided to slide should never change his mind at the last moment.
57. The base runner should not slide into a base with his spikes high. Nor should an infielder so block the base that no option is given the base runner but collision.
58. The head first slide should be eliminated on all areas but the varsity level, and then used only when returning to a base, or when completely off-balance.
59. The fielder must keep his eyes on the ball all the way into his glove, and keep his hands low, to check against an unusual bounce at the last second.
60. No matter how obviously the fly ball is in a player's territory, he should still call for the ball in a loud voice as a matter of habit.
61. It is the baserunner's responsibility to avoid collision with an infield player fielding a batted ball.
62. On plays at the plate, the batter should vacate the area immediately after he has struck or missed the ball.
63. Regular attendance at the practice sessions should be demanded by the coach.

64. The early season workouts should be relatively short, after basic body conditioning, and deal in the execution of the basic fundamentals. Lots of running should be included to insure good condition of legs.
65. Pitchers should be impressed with the importance of control in their workouts. A pitcher should, if possible, always warm up before entering the pitcher's box.
66. All players should be constantly alert for signals when employed to anticipate the play. Signals should be simple and few in number.

### Tennis

Tennis rates very low in accident incidence. In fact, according to Lloyd<sup>48</sup> only one accident occurs per 1,000 participants. Most injuries occur in the area of the leg and foot, due to the quick stopping and turning required. The surprising number of head injuries (42 per cent) are probably due to being struck by the racket in doubles.

The hard surfaced courts are more dangerous than clay or grass courts. All sand and other impediments should be kept off all courts.

The game must be adjusted to the clearance provided around the courts. In doubles the method of coverage should be thoroughly understood, and when there is doubt, it is better to let the return go rather than strike one's partner. When one's ball goes on an adjoining court, the occupants of that court should be warned and permission obtained before the ball is retrieved. Be sure no one is standing close behind you when you are serving. When changing courts, walk around the net.

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<sup>48</sup>Lloyd, Deaver, and Eastwood, op. cit., p. 360.

Golf

Golf ranks very low on the hazardous list, probably because it has been a gentlemen's game, and the rules of etiquette are nothing more than rules of safety. However, there are more people playing the game today and certain safety measures must be taken.

Seaton<sup>49</sup> ranks golf very low on the hazardous list.

The Institute for Safer Living<sup>50</sup> rated golf ball fallout, however, as more dangerous than nuclear fallout--thus far, at least.

It said a nationwide study just completed indicates that more than 15,000 players, caddies, and workmen suffered disabling injuries this past year--a majority of them from flying golf balls.

"Well over half of all golfing injuries," the institute estimated, "were caused by balls driven by 'trigger happy' players."<sup>51</sup>

Among the approximate 15,000 golf accident injury victims, 50 per cent were players; caddies suffered 25 per cent of the injuries; and groundskeepers and other workmen a large part of the remainder.

But swinging clubs injured many others--people who simply stood too close to a fellow player while the club traveled in an arc.

Lightning, as might be expected, got into the golf casualty picture. Always a major hazard on open golf courses, it was estimated to have killed 500 golfers during the past year.

But heat prostration actually felled more players, ranking third after golf balls and swinging clubs as a disabling factor.

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<sup>49</sup>Seaton, op. cit., pp. 344-45.

<sup>50</sup>Decatur Herald, (Decatur, Illinois: December 7, 1961), p. 15.

<sup>51</sup>Ibid., p. 15.

The institute blamed golfing zeal and lack of common sense in exposure to the sun's rays.

The fourth greatest number of golf course victims were felled by overexertion and many of them were older golfers.

Motorists also got into the golf course accident picture. Many were hit by golf balls while driving on roads either adjacent to courses or passing through the courses.

On the other hand, motorists' cars hit both golfers and caddies using golf course roads.

How can you be safe--and not sorry--in golf? The institute makes this suggestion: "Be courteous--and alert."<sup>52</sup>

Here are some other safety suggestions:<sup>53</sup>

Never hit a ball if anyone at all is in possible range, and if a caddy is shagging for you, make sure the sun is not in his eyes.

Don't take practice shots unless it's your turn to hit.

Always stand behind the player making the shot.

If a hole is any way blind, don't hit unless you know for sure players ahead are out or range.

If workers are in range, warn them.

In a wooded or stony rough, be sure other members of your match stand well away while you hit. If a ball may bounce back at you, take an extra, safe, sacrificing shot.

Don't drive powered golf cars on sides of steep slopes.

If a thunderstorm threatens, get off the course. If this is not practical--take shelter in a grove, never under a single tree. If possible, seek low-level protection down in a ditch or sand trap.

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<sup>52</sup>Ibid., p. 15.

<sup>53</sup>Ibid., p. 15.

Beware of the sun: wear a hat; take salt tablets.

Beware of bees and hornets, to whose stings some people are critically allergic.

Golf courses aren't nurseries--leave children home.

Remember your age; you are getting older every day.

## CHAPTER VI

### SUMMARY

In brief, a school may consider that its general sports safety policy is consistent with good educational procedure if the following are considered:

1. If those in charge of the sports program understand the philosophy and psychology of safety.
2. Well-trained coaches to have charge of the sports program.
3. Adequate, properly fitting equipment should be available for all players and facilities meet common-sense standards.
4. A thorough health examination is given to each boy taking part in sports.
5. Participants should not be allowed to play until they are in proper physical condition.
6. Competition should be equal, that is play schools as near the same size as your school.
7. Sufficient reserves are available. Generally, there should be at least twice as many members on a squad as there are playing positions on the team.
8. Each player should warm-up properly before taking part in any sports.
9. Hire only competent officials.
10. Safe transportation should be furnished. Common carriers and school busses are recommended.
11. All participants are given safety instructions in their particular sport.
12. Members of athletic squads should report all injuries promptly.

A more scientific approach to the problems of safety in sports paralleling the work done in the successful accident prevention program of American industry should be done.

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