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# A survey of football injuries occurring in Massachusetts high schools during 1949

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A SURVEY OF  
FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS  
HIGH SCHOOLS DURING 1949

Submitted by  
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(B. S. In Education, University of Nebraska, 1950)

In partial fulfillment of the requirements for the degree  
of Master of Education

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## Chapter 1

### INTRODUCTION

This study is a survey of football injuries occurring in Massachusetts secondary schools during the 1949 season. The following chapters will present information data received by interview and by an injury code sheet and information sheet sent to various coaches in the larger schools who have shown a desire to reduce football injuries. Bias responses which might implicate the findings are small for all data received is recorded from injury record cards or some written record kept by the coach.

✓ The injury and fatality factors of the game of football has stimulated a plethora of research in the past. During the latter 1920's and early 1930's there was a high school death rate of 12.2<sup>1</sup>. As a result of this high rate, extensive and intensive research was carried out to promote greater safety in playing the sport of football.

The greatest achievement to improving football safety was the reorganization of football rules towards better safety. Football equipment and methods of protection were being experimented with also in a final attempt to keep football from being disbanded completely. Since that time football methods have been modified and new methods invented, but still football injuries continue

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1. Lloyd, Deaver and Eastwood, Safety In Athletics, Philadelphia; W.B. Saunders Co., 1936, p. 44.

to occur in great numbers.

This study attempts to show just what the injury situation in Massachusetts secondary schools was over the 1949 football season. It also indicates a relationship between injuries and player.

Since the early 1930's football injury studies concerning research on the high school level have not been very extensive. The most one could hope to learn about the situation was and is usually in newspaper form where all the facts are never released showing the true findings.

It is the intent of this study to show the relationships of injury to the position played, age of the player, time of season the injury was received, and the basic course of the injury. The coach will be able to classify these findings and guard against them by conditioning his team; he will also be aware of the equipment factor in prevention and try to improve equipping those areas most affected by injury.

The player will also benefit by knowing which injuries he may be exposed to because of his position, and those which may occur from lack of full conditioning which he felt was unimportant. The player will have a greater incentive to learn the proper football fundamentals such as blocking, tackling and protecting himself from falls.

To the public this study will reflect the exact findings without the propaganda usually attending newspaper reports. From the findings they may decide whether the situation concerning

injuries is dangerously high or not so bad after all.

To the writer this study will mean factors to guard against when coaching. It will mean a safer attitude to consider when each boy receives instruction and conditioning. Injuries often mean the difference between victory and defeat; therefore, all who are concerned with football may well gain something from this investigation.

#### Definitions of Terms Used

<u>Injury</u>	Damage or hurt done, or suffered. <sup>2</sup>
<u>Bruise</u>	A bruise is caused by a blow to some part of the body which breaks the small blood vessels in the tissues just under the skin. <sup>3</sup>
<u>Brain Concussion</u>	Concussion is caused from an injury to the brain, often resulting from a blow or a fall on the head. There are also concussions of the labyrinth and the verticle column.
<u>Dislocation</u>	When a bone gets out of place at a joint, the condition is called a dislocation.
<u>Fractures</u>	May be a simple fracture, the bone is broken but there is no connecting wound from the break in the bone through the skin. In a compound fracture, the bone is broken and there is also a wound from the break through the surface of the skin.
<u>Femur</u>	The thighbone, or femur, is the longest and strongest bone in the body. It extends from the hip joint to the knee. Its upper end is rounded to fit into socket of the pelvis.
<u>Fibia - Tibia</u>	These bones of the leg extend from the knee joint to the ankle. They are extremely unequal in size. The shinbone, or tibia, is the large and lies on the inner side. It is important in the formation of both the knee and ankle joints. The smaller bone, or fibula lies on the outside. It forms the ankle joint.

1. Webster's Collegiate Dictionary, Fifth Edition, G. and C. Merriam Co., Springfield, Massachusetts, 1946, p. 418.

2. American Red Cross First Aid Textbook, The Blakiston Co., Philadelphia, 1945, pp. 160, 124, 155.

Joint

A joint is formed where two or more bones come together. Some are immovable, like those in the skull, but in most cases where the ends of the bone are covered with cartilage and held together they are moveable.

Sprains

Sprains are also injuries to joints. A sprain is the result of sudden violence applied to a joint either directly or indirectly. Sprains are partial or complete tears of some of the supporting ligaments of a joint cause by forced movement beyond its normal range.

Radius

One of the two bones of the forearm. It extends from the elbow to the wrists, and is on the thumb side of the hand.

Ulna

The bone of the forearm which extends from the elbow to the wrist, and is on the inner side of the hand is called the ulna and it forms most of the elbow.



## Chapter 2

### STATEMENT OF THE PROBLEM

The purpose of this study is to determine the extent of football injuries occurring, and the relationship of these injuries to the players age, position played, the reason of the injury, the time of season the injury occurred, and the days lost because of the injury.

✓ The problem has been emphasized many times because of continual football injuries and fatalities occurring each year; and because of the over-emphasis stressed by many community newspapers concerning the danger of boys participating in football. No extensive study in Massachusetts has been done in this area since Burnett's<sup>1</sup> survey in 1933, and it would be of great value to the coach, the player and the public to have information on a study of injuries from football at this time.

This study may be justified by the general lack of information concerning football injuries of all types. This study will be of great value to the writer who wants to go into the coaching field. Justification of this problem will also be of sound meaning to school trainers, and those in charge of conditioning football teams.

1. J. H. Burnett and F. G. O'Brien, "A Survey of Football Injuries in Massachusetts High Schools," American Physical Education Association Research Quarterly, Vol. 4, October, 1933.

From the data afforded by this study, school trainers, in their efforts to care for the boys' injuries, could foresee many probable facts of injury and would be concerned with doing a sound job daily in preparing the boys for practice and scrimmage as well as for game situations. They would also know that as the season progresses the injury factor increases as the following will show.

✓ The conditioning leader or coach will find it very probable that more attention can be stressed on anatomical areas which undergo the greatest number of injuries. It is an accepted fact that there is less chance for injury when an athlete is warm and the muscles, tendons and ligaments have been subjected to exercises beyond that gained through ordinary activity.<sup>1</sup>

✓ Another factor of great concern should be the obtaining of the knowledge concerning the care of injuries of all sorts. If a school trainer experienced in such matters is unavailable then the coach or an appointed assistant should be supremely interested in knowing the areas of probable injury and the care of them.

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1. Frank Cramer, L. Boughton, Charles Cramer; A Training Room Manual, Cramer's of Gardner, Kansas, 1945.

## Chapter 3

### TECHNIQUES AND PROCEDURES

The logical analysis of this problem may be listed as the following:

1. How many boys are participating in football in Massachusetts schools which data is gathered from?
2. How many schools give physical examinations before participation is allowed?
3. How many of these boys receive some type of football injury?
  - a. Those with head and neck injuries.
  - b. Those with leg and foot injuries.
  - c. Those with shoulder injuries.
  - d. Those with arm and hand injuries.
  - e. Those with pelvic and thigh injuries.
  - f. Those with back and abdomen injuries.

These injuries may be bruises, concussion, cuts, dislocations, sprains, or fractures.

4. How many of the total injuries affect the backfield men, and is there a popular common injury?
5. How many of the total injuries affect the linemen, and is there a popular common injury?
6. Is there any age value connected with most numerous injuries received?
7. What are the largest type of injury occurrence and severity?
8. What are the reasons for each injury?
  - a. Lack of condition.
  - b. Bad equipment.
  - c. Lack of equipment.
  - d. Was the injured player tackled.
  - e. Injured in blocking.
  - f. Injured from tackling a ballcarrier.
  - g. Injured on a pass play.
  - h. Injured carrying the ball.

9. How many days of participation are lost because of the injury?

#### The Research Procedures of Concern

1. The instrument used in this study is composed of an Injury Code Sheet, and an Information Sheet on which to record data. Another method used was by interviewing the coach and recording the facts on an Information Sheet.

2. The data concerned with this study will be obtained by sending this Code and Information Sheet to high school coaches selected because of their school size and location.

3. Forty four letters were sent out to these schools and six schools were visited by the writer who recorded the information from the records. Those schools which were contacted by letter the coach recorded the wanted data in the same manner the writer did, from the various records kept.

4. Of the forty four letters sent twenty eight of them were returned, this made a total of thirty four schools from which data was received.

#### Data Needed and Requested on the Information Sheet Sent Out to the Coach for Recording

1. Number of football participants involved.
2. Number receiving examinations.
3. Age influence on injury, if any.
4. Position injury involves more than any other.
5. Types of injury occurring more than others.
6. Reason for injury received.

7. Part of football season injuries occurred in greatest number.

8. Days lost to participation because of injury received.

Injury is defined by Webster's Collegiate Dictionary as damage or hurt done or suffered.

The requested data will be procured from injury cards, injury record files, doctors files or records if no others are available, and from the coaches themselves who are the primary witnesses to all injuries received, whether it occurred in a game or during a scrimmage, or in another manner.

## Chapter 4

### PRESENTATION OF INJURY DATA

The national studies made by Lloyd and Eastwood<sup>1</sup> indicate an accident incidence of 8.7 per 1,000 exposures among high school players. From the survey of football injuries made by the writer it was found that Massachusetts schools showed an injury incidence of 16.5 which is above the national findings of 1936.

Of the thirty four schools there were 2,016 boys who participated in football. Of that number 333 received injuries of one type or another, as will be shown further along in this chapter.

Table 1 shows the following injury incidence.

Table 1

#### Injury Incidence of Massachusetts Secondary Schools

Number of Schools in this Study	Number of Players Out for Football	Number of Injuries Received	Injury Exposures per 1,000
34	2,016	333	16.5

The number of schools which showed that physical examinations are given before participation is allowed was very high. The table below shows the percentage giving physical examinations.

1. Op. cit., Lloyd and Eastwood.

Table 2

## Number of Schools Giving Physical Examinations

Number of Schools		Percentage of Schools Giving Physicals
Giving Physical Examinations	33	97
Not Giving Physical Examinations	1	3
Total	34	100

Table 3 shows the positions affected by injury most frequently. It will show that the linemen had one hundred and eighty seven injuries compared to the backfield men who had one hundred and forty six injuries. This can be expected with more men playing in the line than in the backfield.

Table 3 also shows that the guard position involves 33.6 per cent of the total line injuries. The ends were next with 29.9 per cent of the total linemen injuries. Centers were the players who show a low injury percentage with only 12.5 per cent of the total. It would seem from these findings that lighter boys ~~intending to play a~~ position because of its safety should pick out the center or end position.

The total linemen injuries were greater than the backfield injuries. The line men totaled 56 per cent of the total number of injuries, and the backfield men obtained 43.8 per cent of the total number of injuries received.

Table 3

## Injury Frequency by Position

Number and Position of Player Injured in Line	Percentage of Total Injuries
Guards . . . . . 63	33.6
Ends . . . . . 56	29.9
Tackles. . . . . 45	24.0
Centers. . . . . 23	12.5
Total . . . . . <u>187</u>	<u>100.0</u>

Table 4 is concerned with the age distribution of players receiving injuries.

The seventeen year old players have the highest percentage of injuries with 38 per cent of the total. Sixteen year olds are next with 32 per cent, eighteen year olds with 19 per cent and fifteen year olds with 11 per cent of the total number of injuries, this can be expected for there are less fifteen year olds playing.

Table 4

## Age Distribution of Injuries Received

Number and Age of Players Injured	Percentage of Total Injuries
17 years, 127 injured	38
16 " 108 "	32
18 " 63 "	19
15 " <u>35</u> "	<u>11</u>
Total 333	100

Table 5 shows the number and type of injuries received by 333 boys. From this table a general understanding will be obtained as to which injuries are most prevalent.



Table 5  
Types and Percentage of Injury Occurrence

Number and Type of Injury		Percentage of Total Injuries Received
Bruise	51	15
Concussion	18	5
Cuts		
Arm	0	0
Body	0	0
Head	10	3
Leg	2	1
Dislocations		
Ankle	6	2
Elbow	2	1
Hip	2	1
Knee	5	2
Sacro-iliac	0	0
Shoulder	8	2
Sprains		
Ankle	52	16
Back	8	2
Elbow	3	1
Finger	13	4
Knee	36	11
Shoulder	7	2
Spine	2	1
Toe	2	1
Wrist	9	3
Fractures		
Arm		
humerus	0	0
ulna	2	1
radius	2	1
wrist	2	1
Clavicle	6	2
Foot	2	1
Leg		
femur	4	1
tibia	5	2
fibia	1	*
both bones	1	*
Hand	10	3
Jaw	1	*
Nose	19	6
Rib	3	1
Skull	3	1
Spine	0	0
Infections	4	1

Table 5 (continued)

Number and Type of Injury		Percentage of Total Injuries Received
Broken teeth	18	5
Water on knee	2	1
Others		
torn knee cartilage		*
sick stomach from abdominal blow		*
torn muscle in thigh		*
Kidney bruise		*
pulled groins		*
crest of illium		*
calcification from charley horse		*
Totals	<u>333</u>	100 %

\*In that these injuries percentages are so small they are of little significance. Collectively they amount to 3 per cent.

✓As shown in Table VI of the three hundred and thirty three injuries received sprained ankles led with fifty two. Next in order are the bruises with fifty one. Bruises consist mostly of charley horses. Sprained knees are next in line with thirty six injuries. Concussions had eighteen injuries. The last of the greater occurrence of injuries is the fractured nose with nineteen.

Table VI

## Singular Injuries of Highest Number

Part of body	Number of injuries
Ankle	52
sprains	52
dislocations	6
fracture	1
Thigh	51
bruises	51
Head	18
concussion	18
cuts	10
fracture	24
Arm and hand	9
cuts	9
dislocation	0
sprains	22

Table VII shows the percentages of leading body injury areas. It also shows the total number of days lost for each injured area.

Leg and foot injuries were the leading area with one thousand six hundred and sixty two days lost. The head and neck area were next, but although the percentage was high the days lost were only three hundred and thirty four. Arm and hand areas were thirteen per cent of the total injuries, but were severe in that five hundred and forty five days lost. Shoulder and back injuries showed the least percentage with only ten per cent of total injuries, and only three hundred and sixty seven days lost.

Table VII

Injury Area, Percentage to Total Injuries, and Days Lost Of Leading Body Injury Area

Name of Leading Body Injury Area	Percentage of Total Injuries	Number of Days Lost from Injury
Leg and Foot area	50	1,662
Head and Neck area	21	334
Arm and Hand area	13	545
Shoulder and back area	10	367
Others	6	389
Total	100	3,297

✓ Table VIII shows impressively the important reasons of the injury, in other words it is the "how" or "way" it occurred. From this table valuable information can be gained as to how coaches, trainers and players should perfect their abilities by conditioning, proper protection, and learning the value of basic fundamentals such as blocking and tackling correctly.

Tackling is the greatest reason for injury occurrence, the

ability to tackle correctly should be drilled on at every possible opportunity. Blocking is next, and like tackling it is a fundamental worth every possible minute of practice. Fifty seven of the injuries were due to being tackled, and fifty one of the injuries were because of piling up on the ball carrier, and due to line convergence on the ball carrier as he carried the ball into the line. Fourteen reasons of injury were due to bad equipment and fourteen were injured on pass plays. Lack of condition caused twelve injuries and nine were due to clipping. Lack of equipment was not credited with being the reason of any injury. Most schools do have excellent equipment which helps greatly in keeping injuries from occurring.

Table VIII

## Causative Factor in Injury

Reason of Injury	Number of Occurrences
Lack of Condition	12
Bad Equipment	14
Lack of Equipment	0
Injured player was tackled	57
Injured from tackling ballcarrier	98
Injured in Blocking	78
Injured on a Pass Play	14
Injured Carrying Ball other than being tackled.	51
Clipped	9
Total	333

Table IX shows the part of the season the injury occurred. From this table it will be seen that injuries because more numerous as the season progressed. There may be reasons for this which

will be discussed in the following chapter.

Table IX  
Part of Season Injury Occurred

Part of Season Injury Occurred	Number of Occurrences
Pre-season Training	17
Scrimmage First of Year	33
First Part of Football Season	75
Middle of Football Season	109
Latter Part of Football Season	99
Total	333

Table X illustrates the fact that if the days lost per player were divided into by the number of players out for football, all of the players would have missed at least 1.2 days of football.

Table X  
Number of Days Lost to Participation Compared to Number of Players Out For Football

Number of players out for Football	Number of Days Lost	Percentage per Player
2,016	3,297	1.2

  

Number of Football Injuries	Number of Days Lost	Number of Days Lost Per Injury
333	3,297	9.9

## Chapter 5

### DISCUSSION OF DATA

This survey is based upon thirty four schools of the larger cities and towns of Massachusetts. These cities and towns are from all types of communities in Massachusetts and provide a good sample of the many parts of the state. The master table<sup>1</sup> shows these cities and towns which make up this survey.

On the basis of the findings the average team would be composed of fifty nine players, with an injury incidence of 16.5, as shown in Table I.

Studies carried out by Burnett<sup>2</sup> in 1933 showed thirteen Boston schools with average teams consisting of sixty players and an injury incidence of 7.1 to 8.7. Also over this period from 1929 to 1932 Burnett made investigations involving ninety three to one hundred and three schools of all sizes in Massachusetts. He found that the percentage of injuries was greater with an incidence of 11.4, which is ~~and~~ not identical to the findings of the writer.

✓ The danger of football has been over-emphasized greatly. We all know the ruggedness is great, but the publicity concerning the number of accidents and deaths most of the time are not authentic.<sup>3</sup> Although no injury or fatality can be taken lightly, they all must

1. See appendix.

2. Op. cit. J. H. Burnett and F. G. O'Brien.

3. Seaton, D., Safety In Sports; Prentice-Hall, Inc., New York, 1948, p. 213.

be considered in the light of the large number competing (600,000 high school and 65,000 college players) and the nature of the game.<sup>1</sup>

Dr. Stevens in his book says the following:

While there is a certain element of rise in football (or any strenuous athletic sport), the inherent dangers of football have been greatly exaggerated. The majority of coaches have never seen a football fatality due to the sport. Without a lengthy dissertation on the subject, it might be well to point out that in our experience it is definitely more dangerous to drive to the Yale Bowl as a spectator than it is to play football the entire season, as our accident rooms are frequented much more often by spectators than players.

"With many thousand automobile accidents every month, it is probably safer to keep our youth healthy on playing fields."<sup>2</sup>

Eastwood, who has been the official statistician for football since 1932, verifies this statement by pointing out that:

Generally speaking, traffic fatalities for the ages 15-24 years for 1945 are fourteen times greater than the average high school football fatality rate per 100,000 players for the past fourteen years.<sup>3</sup>

Any boy who is planning to participate in a strenuous sport such as football should first have a thorough physical examination by his own doctor. Such an examination is required in most high schools. Any organic or structural weakness, such as a heart condition, will generally be spotted at once. The examination will relieve the parents fears also.<sup>4</sup>

1. Seaton, D., Safety in Sports; Prentice-Hall, Inc., New York, 1948, p. 214.
2. Stevens, Marvin and Phelps, W. L.; Control of Football Injuries. A. S. Barnes and Company, Inc., p. 9.
3. Eastwood, Floyd R.; Fifteenth Annual Survey of Football Injuries American Football Coaches Association, Committee on Injuries and Fatalities, January, 1947, p. 27.
4. Waldorf, Lynn O., "Keep Safety in First-String Line Up". Safety Education, September, 1946.

Other thoughts concerning examinations are viewed by Morrison<sup>1</sup> who says, "A health examination should be given to all students before they are allowed to compete in sports."

The writer found that ninety seven per cent of the Massachusetts high schools do require the participant to receive a health and physical examination before he can compete in football.

Every player should have a thorough physical and health examination before the season starts. Stevens and Phelps also advise a follow-up examination at the end of the season. They advocate the football examination include:

1. A detailed medical history, with particular emphasis on old injuries and past illnesses.
2. A routine examination of the different parts of the body.
3. A seven-foot plate of the heart and a stereoscopic X-ray of the chest.
4. Urine analysis.
5. A blood count and differential, which will prove of interest for future reference.
6. Special tests, such as vital capacity, the Schneider, and coordinating balance tests.
7. Postural examination.

They also feel that those cases where physicians claim a boy unfit, corroboration with another doctor be advised.<sup>2</sup>

1. Morrison, Whitelaw M., and others, Normal and Elementary Physical Diagnosis, Lea and Febiger, Philadelphia, 1941, p. 12.
2. Op. cit. Stevens, Marvin and Phelps, W. L., p. 4.



In comparing the number and position of linemen injured it was found that the guard position was involved in thirty four per cent of the linemen injured. The ends were next with thirty per cent of the linemens' one hundred eighty seven injuries. The tackle position showed forty five injuries received and twenty four per cent of the total. The centers position was the least affected by injury. This could be due to the center backing the line on defense where contact is not as great as that of the guards who are on the point of attack stationed in the middle of the line on defense, and on offense their position es ever dangerous because of their assignments. Another important fact to consider is that the guard is usually a smaller, faster man than your center or tackle personnel.

The backfield men did not suffer the high number of injuries as did the linemen. Yet when one considers the number of the linemen on the line of scrimmage compared to the backfield men, they should have more injuries. The report shows that only one hundred and forty six injuries were received by backfield men. This is on offensive as well as defensive play.

Lloyd and Eastwood<sup>1</sup> in 1935 found that the greatest position incurring injuries were the right and left halfbacks. Since that time offensive football has changed greatly with many new formations based on quick-opening plays and surprised cutbacks which are

I. Op. cit. Lloyd, D and Eastwood, p. 62.

usually over the guard territory. Better officiating and better protection equipment has also been a great factor in eliminating many injuries. The backfield man who was piled up and open to unnecessary roughness at every possible opportunity must have received many unnecessary injuries.

Eight leg fractures were received by linemen. The linemen also received five arm fractures and fractured two clavicles. Dislocated knees were higher with the linemen than the backs. The backs did have more sprained ankles and fractured arms. Bad bruises and concussions were highest with the linemen.

Table IV showed the age distribution of injuries received. The seventeen year old players obtained the highest number and percentage of injuries with one hundred and twenty seven injuries and a percentage of thirty eight of the total. Sixteen year olds were next with thirty two per cent of the total injuries. Eighteen year olds were third with nineteen per cent and fifteen year olds were last with eleven per cent. It would seem justifiable to consider the majority of participants out for football as sixteen and seventeen years of age, therefore, this age group would receive the greater percentage of injuries.

The data received from the thirty four schools showed that the type of injury occurring more than the others was the sprain. Sprained ankles lead with fifty two cases recorded. Sprained knees were great in number too with thirty six cases, and the toe had two sprains recorded. Bruises totaled fifty one in number and fifteen per cent of the total injuries received. These injuries

were of the charley horse variety, mostly with the sartorius muscle exposed mostly and receiving the majority of the damage. Fractures accounted for sixty one injuries. Of this amount fractured ulna, radius and wrist had two apiece. The clavicle accounted for six fractures. The foot two. Leg fractures amounted to eleven with the tibia being broke five times, the femur four times, the fibia once and both the tibia and fibia once. Fractured hands amounted to ten cases while the nose accounted for nineteen cases. The rib and skull had three reported cases.

✓Lloyd and Eastwood<sup>1</sup> in their book state that thirty nine per cent of the high school injuries in their study were of the leg and foot area and nineteen per cent of the injuries were to the arm and hand portion of the body. Therefore, the areas which are still most likely to receive injury will probably always remain high no matter how much we try to protect and educate against injury. Many cases, however, could undoubtedly be reduced by better care to those injuries received but not allowed to heal strongly. Ankles, knees and fingers are most popular structures which are continually receiving further injury before the old injury becomes strong. This has led many times to disability later on in life, and hurt many good performers from showing their true abilities. It cannot be stressed too strongly how important it is that proper training

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1. Op. cit. Lloyd, D. and Eastwood, p.46.

facilities be acquired to keep new injuries from occurring by means of proper heat, water and rest treatment.

Table VII shows the percentage of total injuries and the number of days lost from these injuries. The leg and foot area lead with one thousand and sixty two days lost. As was stated before the leg and foot area along with the arm and hand area are extremities which cannot help but receive severe injuries. The arm and hand area shows thirteen per cent of the total injuries with five hundred and forty five days lost. These two areas account for over half the injuries received in this survey from Massachusetts high schools. Shoulder and back injuries showed the least percentage with only ten per cent of the total injuries, and only three hundred and sixty seven days lost.

✓The reason of injury occurrence as seen in Table VIII tackling and blocking, the reasons which every boy should realize as being injurious, if not learned correctly. These findings agree with Lloyd and Eastwood<sup>1</sup> who found that eighteen per cent of the accidents was from blocking and seventeen from tackling, these injuries, however, were not as severe as when blocking or tackling was being done by the opponent.

The part of the season in which the injury occurred was successful in showing in Table IX that as the season progresses

1. Op. cit. Lloyd, D. and Eastwood, p. 59.

the number of injury occurrences grows in number. ✓ The middle of the football season had the greatest number of occurrences with one hundred and nine, while the latter part of the football season showed ninety nine occurrences. This may be due to laxness on the part of the coach in not keeping continual practice in blocking and tackling whenever possible. Scheduling, also, is a big factor, for as the season progresses so does the ability of the opponents met. Conditioning is always a big factor at the beginning of the season, but as the season progresses body conditioning slows up for more seemingly important undertakings such as offensive and defensive play pattern.

## Chapter 6

### SUMMARY AND CONCLUSIONS

With proper conditioning and supervision, with the best available equipment, and proper playing fields, with the presence of the team's physican,. football participation should be a safer more pleasant experience. Also with the properly arranged schedules under good officiating, football as played today in our secondary schools is certainly worthwhile educationally and also safer than in past history, as far as fatalities are concerned.

Factors, however, which must be considered as contributing, to football injuries can be listed under four headings, conditioning, mental condition, lack of reasoning and skills limited.

#### 1. Conditioning

- a. Minus strength and weight
- b. Handicapped by deformity of some type
- c. Handicapped by lack of muscular control
- d. Does not accept conditioning drills as important

#### 2. Mental Condition

- a. Violates rules of safety
- b. Showoff qualities
- c. Has a bad attitude towards others
- d. Lacks athletic intelligence

#### 3. Lack of Reasoning

- a. Failure to realize safety use and need of equipment
- b. Care and treatment of injuries

- c. Health and sanitation reasoning
  - d. Rules of game
4. Skills limited
- a. Motor capacity low
  - b. Motor skills not easily learned
  - c. Poor coordination of body
  - d. Basic football skills absent

#### Conclusions

1. More injuries occurred to the seventeen year olds than to any other age class. There seems, however, to be no connection between age and the type or seriousness of injury.

2. Guards and ends received more injuries than any other team members. Guard injuries were more serious than any other positions played.

3. Physicians administered physical examinations to all but one school data was received from. And there is a strong probability that the one school not listing physical examinations administered the same examination by some other means than through the school.

4. Boys playing interscholastic football are more apt to receive bruises, sprained ankles, sprained knees. Linemen will probably receive more fractured legs, while backfield men receive more sprained ankles and fractured arms. The majority of severe injuries are received by the linemen.

5. Injuries show that the big majority are received from the middle of the season to the end of the football season. This undoubtedly is due to the reduction of conditioning procedures

for some other type of seemingly more important drill.

6. The 3,297 days lost from injuries is very high, but that is to be expected with more severe injuries than bruises and other minor occurrences. Fractures, sprained knees and ankles kept more boys from participation than any other of the injuries received.

7. Safety in football depends on discontinued play of fatigued persons. This is a proven fact to remember.

8. Proper personal equipment should be worn at all times.

9. Every school sponsoring a football team should be interested in some insurance program for the players protection.

10. The removal of all unsafe acts by the participant will help eliminate accidents and injuries. If this could be done than football might be removed as a game.

11. Accident repeaters should be prevented from participation at all cost, for it is these individuals who receive repeatedly the more severe injuries.

12. Physicians should be attending all scrimmages and games.

13. All playing surfaces used for football should be of safe composition.

14. Schools would profit by incorporating a member of the football staff as a trainer with full duties in caring for the participants properly.



APPENDIX

Please answer question by marking with proper code number the lists indicate.

Example: If injury was ankle dislocation just list # 7 under column asking for code number of injury. Answer other headings in same fashion.

### INJURY CODE NUMBER

1. Bruise	<u>Sprains</u>	e both ulna and radius
2. Concussion	25. Ankle	15. Clavicle
	26. Back	16. Foot
<u>Cuts</u>	27. Elbow	17. Leg
3. Arm	28. Finger	a femur
4. Body	29. Knee	b tibia
5. Head	30. Shoulder	c fibia
6. Leg	31. Spine	d both tibia and fibia
<u>Dislocations</u>	32. Toe	
7. Ankle	33. Wrist	18. Hand
8. Elbow	<u>Fractures</u>	19. Jaw
9. Hip	14. Arm	20. Nose
10. Knee	a humerus	21. Rib
11. Sacro-iliac	b ulna	22. Skull
12. Shoulder	c radius	23. Spine
13. Spine	d wrist	24. Infections
		34. Broke teeth
		35. Later on knee
		36. Others (name)

### CODE NUMBER FOR REASON OF INJURY

1. Lack of condition
2. Bad equipment
3. Lack of equipment
4. Injured player was tackled
5. Injured from tackling ballcarrier
6. Injured in blocking
7. Injured on a pass play
8. Injured carrying ball

### PART OF SEASON INJURY OCCURRED

1. Pre-season training
2. Scrimmage first of year
3. First part of football season
4. Middle of football season
5. Latter part of football season

### DAYS LOST FROM INJURY

List number of days unable to participate in practice or game.



A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949

Name of School	No. out for football	No. of injuries received	Player		Age				Physical Examina- tions	Type of Injuries Received								
			Position	Age	15	16	17	18		Bruise	Concus- sion	Dislocation						
												7	8	9	10	11	12	13
Amesbury	38	6	3	3	3	3	2	1										
Arlington	34	7	5	2	3	3	4		Yes		1							1
Belmont	115	14	8	6	6	3	2	3	Yes	1	1							
Clinton	55	8	3	5	1	3		4	Yes									
Concord	60	4	3	1		1	1	2	Yes									
Dedham	105	5	3	2		1	4		Yes	1					1			
Fall River (Durfee)	42	18	11	7	1	5	9	3	Yes	3								
Fitchburg	75	5		5		3	2		Yes			1						
Framingham	70	26	19	7	5	3	4	14	Yes	4	4							
Gloucester	71	3	2	1		2	1		Yes									
Hingham	80	17	11	6	8	7	2		Yes	3	2						1	1
Hopkinton	22	2		2		1	1		Yes									
Hudson	85	11	6	5	4	3	4		Yes	1	1		1					
Ludlow	34	5	4	1		1	2	2	Yes									
Malden	98	11	5	6		1	4	6	Yes	1		1	2	1			1	1
Marblehead	50	5	3	2		2	3		Yes	2				1				
Milford	25	6	3	3	1	3	2		Yes	1	1		1					
Milton	50	7	4	3		3	3	1	Yes	1								
Natick	55	10	5	5		4	5	1	Yes	3	1							
Newton	100	14	8	6		6	8		Yes	1	1							
New Bedford	80	19	13	6	4	7	5	3	Yes	5	2							
North Andover	46	12	6	6	2	2	8		Yes	4				2				
Palmer	45	15	8	7	2	1	1	2	Yes	9		1					1	
Plymouth	55	4	2	2		1	3		Yes									
Quincy	95	13	8	5		8	4	1	Yes	2								
Saugus	35	9	8	1			6	3	Yes	2	1							
Taunton	28	1		1				1	Yes									
Webster	28	7	3	4	1	2	4		Yes			3						
Wellesley	60	12	1	6		8	4		Yes	1							1	
Westboro	36	14	3	11	1	9	4		Yes									

A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949  
(continued)

Name of School	No. out for football	No. of Injuries Received	Player				Physical Type of Injuries Received											
			Position	Age	15	16	17	18	Examina- tions	Bruise	Concus- sion	Dislocation						
			Line	Back							7	8	9	10	11	12	13	
West Springfield	60	14	8	6	3	5	8	10	Yes	3							2	
Weston	52	3	2	1			3		Yes		1							
Pittsfield	72	11	8	3		2	3	6	Yes								1	
Greenfield	60	15	6	9	1	5	6	3	Yes	3	2							
<b>Totals</b>	<b>2,016</b>	<b>333</b>	<b>167</b>	<b>146</b>	<b>35</b>	<b>108</b>	<b>127</b>	<b>63</b>		<b>51</b>	<b>18</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>8</b>	<b>0</b>

A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949 (Continued)

Name of School	Cuts				Sprains									Fractures																
	3	4	5	6	25	26	27	28	29	30	31	32	33	Arm					Leg					Fractures						
														14a	b	c	d	e	15	16	17a	b	c	d	18	19	20	21	22	23
Amesbury	1			1				1																		1				1
Arlington									1			1				1						1								
Belmont					1				2				2						1		1		1			1	3	1		
Clinton					2				3									1			1									
Concord					2				1																					
Dedham										1																1				
Fall River (Durfee)						1	1		4	1			1										1			3				
Fitchburg				3					1																					
Framingham				1				3	1		1		2								1				4	2			1	
Gloucester				1					1																			1		
Hingham										1		1								1		1		2	2				1	
Hopkinton																1											1			
Hudson						1		1	1							1	1	1	2											
Ludlow			2	1				1	1																					
Malden				3				1																					1	
Marblehead				2																										
Milford				1					1																	1				
Milton				1												2								2						
Natick	1			2					1																			1		
Newton				3			1	4	1																1					
New Bedford	1			4					1	1	1		2			1								1						
North Andover				2				1		1		1																		
Palmer				2																										
Plymouth				2																										
Quincy	2								4																2	2				
Saugus				1					1																					
Taunton									1																					
Webster	2																										1			
Wellesley				3	1		1	2					1														1			
Westboro	3			8																										1
West Springfield				2	1			5																						
Weston				1																										

A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949 (Continued)

Name of School	Cuts				Sprains						Fractures																					
	3	4	5	6	25	26	27	28	29	30	31	32	33	Arm					Leg					Fractures								
														11a	b	c	d	e	15	16	17a	b	c	d	18	19	20	21	22	23	24	
Pittsfield					1	1	1	1	1	1																						1
Greenfield					2	3				2										1	1											
Totals	1	1	12	2	52	8	3	13	36	7	2	2	9	0	2	2	2	0	6	2	4	5	1	1	10	1	19	3	3	0	4	

A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949 (Continued)

Name of School	Teeth	Water	Others listed	Reason of Injury								Part of Season					Days lost from injury		
				1	2	3	4	5	6	7	8	clipped	Injury occurred						
	34	35	36									1	2	3	4	5			
Amesbury		1					1	1	2	2		1	1	2	1	1	9		
Arlington	1					1	2	1	1	2			2	2	2	1	100		
Belmont						2	4	3		1	4				5	9	96		
Clinton	1					4	2	2						4	2	2	155		
Concord			1 torn cart. knee			3	1					1	1	1	1		70		
Dedham			1 sick stomach	1		2	1		1	bad field	1	1	1	2			130		
Fall River (Durfee)	3					1	2	10		5			2	1	9	6	154		
Fitchburg						4	1						1	1	3		115		
Framingham	2					1	5	7	9	4				7	13	6	214		
Gloucester						1					1	1				2	43		
Hingham	1	1				1	1	1	4	6	1	3	2	2	5	6	2	134	
Hopkinton								1								1	1	30	
Hudson						1		4	3	1	2			3	1	5	2	130	
Ludlow								1	2		2		2			1	2	41	
Malden								2	2	5	1	1		1	4	4	2	210	
Marblehead						1		2		2				1	1	3		104	
Milford	1					1	4	1					2		3	1		42	
Milton						1		3	3				1	3	1	2		131	
Natick	1					2	1	1	1	5			2	4	2	2		17	
Newton			2 torn muscles			1	2	2	5	2	1	1		1	3	1	9	59	
New Bedford						1		1	2	4	1		2	5	3	4	5	160	
North Andover	1							8	2	1	1			1	6	4	1	21	
Palmer	1					1		2	5	3	4		3	1	5	2	4	90	
Plymouth	1								1		1	2		1	1	2		60	
Quincy			1 kidney bruise					1	7	4	1			2	4	6	1	120	
Saugus	4		4 pulled groins	4				1	4					1	1	7		69	
Taunton								1								1		30	
Webster	1							1	5		1			2	1	1	3	143	
Wellesley	1							2	4	2	1	3		1	2	3	4	2	131
Westboro	1					2		2	3	2	5			2	7	5		120	
West Springfield						1		4	5	2	2			2	3	3	6	104	
Weston			1 crest of illium																



A SURVEY OF FOOTBALL INJURIES OCCURRING IN MASSACHUSETTS HIGH SCHOOLS DURING 1949 (Continued)

Name of School	Teeth	Water Knee	Others listed	Reason of Injury								Part of Season					Days lost from injury		
				1	2	3	4	5	6	7	8	clipped	Injury occurred						
	34	35	36									1	2	3	4	5			
Pittsfield	2		1	calcification from charley horse															126
Greenfield					3	6				2		4	6	1				117	
					3	5	3	4				2	2	5	6				
TOTAL	17	2	11		12	10	98	14	19	21		17	75	99			3,297		
					14	57	78	51				33	109						

BIBLIOGRAPHY

## BIBLIOGRAPHY

Theses

Dunnaway, Edward, Athletic Injuries in Class "A" High Schools In Arkansas, Unpublished Master's Thesis, University of Texas, 1932.

Books

American First Aid Textbook, The Blakiston Company, Philadelphia, 1945.

Bilik, S. D., The New Trainers Bible, Reed Press: New York, 1946.

Cramer, Frank and Charles, Boughton, L. L., A Training-Room Manual, Cramer's of Gardner, Kansas, 1945.

Lloyd, Frank, Deaver, George G. and Eastwood, Floyd R., Safety In Athletics, W. B. Saunders Co., Philadelphia, 1936.

Morrison, Whitelaw M. Normal and Elementary Physical Diagnosis, Lea and Febiger, Philadelphia, 1941.

Seaton, Don, Safety In Sports, Prentice-Hall Inc., New York, 1948.

Webster's Collegiate Dictionary, Fifty Edition, G. and C. Merriam Co., Springfield, Massachusetts, 1946.

Periodicals

Burnett, J. H., O'Brien, F. G. A., "Survey of Football Injuries in the High Schools of Massachusetts," American Physical Education Association Research Quarterly, Vol. 4, October, 1933.

Eastwood, Floyd R., "Causes of Sports Accidents," American Physical Education Association Research Quarterly, October, 1934.

Neilsen, N. P., "The Nature, Frequency and Age Incidence of Injuries in Interscholastic Football," American Physical Education Association Research Quarterly, Vol. 4, October, 1933.