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Knowledge, present utilization and potential for expansion of the optometric role in sports vision

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Degree Type
Thesis

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KNOWLEDGE, PRESENT UTILIZATION AND
POTENTIAL FOR EXPANSION
OF THE OPTOMETRIC ROLE IN SPORTS VISION

A THESIS
PRESENTED TO THE FACULTY
OF
PACIFIC UNIVERSITY
BY
DOUGLAS C. BARTON
KAREN RUCKEL CAHILL
LAUREN K. LINK

IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE DEGREE
DOCTOR OF OPTOMETRY
MARCH 1981

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KNOWLEDGE, PRESENT UTILIZATION AND POTENTIAL FOR EXPANSION OF THE OPTOMETRIC ROLE IN SPORTS VISION

BY

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Final Grade

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ABSTRACT

The goal of this project included assessing the level of knowledge of athletic teams about optometry, discovering the usefulness of existing sports vision systems, and determining the interest of teams and optometrists in the subject of expanding sports vision programs.

Professional and college baseball, basketball, and football teams were queried by means of a survey. To gauge optometric opinion, separate inquiries were mailed to practitioners throughout the country.

Results indicated that there is an unmet need for vision care (i.e. screening, contact lenses, and visual training) for the athletes. Optometrists demonstrated an overwhelming interest in prescribing for the athlete in private practice as well as in a consultation role to sports teams.
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INTRODUCTION

Optometry as a whole has failed to recognize the vast opportunity that lies in the area of sports vision. "The athlete is usually the choice in health and physical standards. He usually has received adequate group health and dental attention. However, in most instances, his vision needs have been neglected as a team function" (Martin 1964). Optometrists may serve as vision consultants for sports teams or provide counseling to patients in their private practices.

A consultants' role should include screenings as well as vision training, contact lens fittings, education about vision, advice about eye protection, and on-call service during games.

Jim Carlson, director of the Totem Lake Vision Centre in Seattle, recommends approaching the coaches about your services. He has found them very interested in anything that will improve the performance of his players. Coaches are generally unaware of the problems poor vision causes for a player. Demonstrating what drastic improvement can be made in a player's performance can really make a coach eager for the optometrist's services ("Optometry's Role in Sports", 1979).

Joshua Breschkin is a former consultant optometrist for the Baltimore Colts of the National Football League. He reported many players that were "visually handicapped". Many rookies arrived at training camp without needed glasses, missing a contact lens, or in need of other visual care. Visual ability should be checked prior to training camp so that the athlete can concentrate fully on winning his position on the team. The vision consultant
should be knowledgeable in the areas of eye-body coordination, binocularity, peripheral vision, nearpoint performance, etc. To be involved in sports vision the optometrist should appreciate and understand sports in general (from Berry article, 1975).

One of the duties of the sports vision optometrist is to counsel the young athlete and either direct him or her into an area for which their present visual skills are suited or develop his visual skills to suit the sport in which they are interested.

There is also an opportunity for optometry in the area of recreational sports. One area is providing ocular protective devices for racquet sports. Specially designed bifocals for the presbyopic golfer can be very helpful. Special frame design for particular sports is useful. Larger frames or contact lenses will increase the peripheral vision. An adequate knowledge of the various optical tints available is essential for the sports vision optometrist. Visual therapy can also be of value to the recreational athlete. Skills such as visual pursuits, saccades, depth perception and visualization can be improved with training (Runninger 1979).

**VISUAL SCREENINGS**

Conducting visual screenings for sports teams is an area where optometrists should become more actively involved. Several studies have shown that many athletes, even on the college and professional levels, fail to meet the minimum criteria levels established for visual performance (Bouscher 1968, Martin 1964, and Garner 1968).
An adequate visual screening according to Bouscher (1968) consists of:

1) short case history
2) visual acuity
3) ophthalmoscopy
4) retinoscopy
5) cover test
6) visual angle test (peripheral vision)
7) stereopsis

This entire sequence should require about ten minutes.

He established the following levels for failure in the screening program:

1) less than 20/30 V.A. in either eye
2) any suspected pathology
3) 1.50 D. hyperopia (or more)  .50 D. myopia (or more)  
   1.00 D. of astigmatism (or more)
4) any tropia  
   lateral phoria of 8  
   vertical phoria of 3
5) less than 80 degrees of lateral peripheral vision
6) inadequate depth perception
7) discomfort with contact lenses
8) wearing spectacles for sports that are not safety glass or plastic.

In his study Bouscher found that 28% of the athletes failed the screening.

Martin (1964) found that 21.6% of the athletes screened failed. Among the problems reported by the athletes were a basketball player who couldn't see the scoreboard and a pole vaulter not in line with pole slot. Athletes also reported uncertainty about distances which threw off their timing.
Garner (1963) conducted a vision screening on high school and college athletes. He reported that 28% of those tested failed. Thirty percent had never had a previous eye examination with over half of these failing the screening. Garner also reports that visual screening services can make up a significant portion of a practice. His annual income from screenings was about $30,000 at that time.

**CONTACT LENSES AND SPORTS**

The literature dealing with sports vision repeats the praises of contact lenses versus spectacles article after article. The advantages of contacts given by the various authors range from comfort and convenience to myopia control in the younger athlete (Garner, 1977). Contact lenses as a whole (PMMA and the newer hydrophilic) if fit correctly do offer many advantages over spectacles, especially in contact sports where glasses may easily be damaged.

Contact lenses are more stable on the face than glasses and clear vision may still be obtained in unusual head positions. Because the eyes are both looking through the optical zone of the lens at all times, better "teaming" between the two eyes is achieved. This is not the case with spectacles, especially those with high prescriptions, as the athlete may be forced to look through the edge of the lens or far enough from the optical center to create a prismatic effect, glare, and distortion (Garner). 1976. Because the eyes are working more together with contacts, better
depth perception and judgement of speed and direction of moving objects may also be noted. This may especially be true of an outfielder looking up and over his shoulder to catch a fly ball on the run.

Peripheral vision is not inhibited by the presence of spectacle frames if contacts are being used. Depending on the style of frame being worn, peripheral vision may be restricted by as much as 15-25% and this is increased if the athlete wears them under an already limiting football helmet. Safety frames have somewhat limited the extent of damage obtained by frame breakage in contact sports, but are themselves limited due to the bulkiness of some of the styles. Contacts do not contribute to facial damages.

The ever-present fogging problem incurred with spectacles due to weather conditions or perspiration is eliminated with contact lenses. Other environmental problems are more easily dealt with by contacts such as mud splatter and raindrops. These can drastically decrease an athlete's performance when streaming down spectacle lenses.

Westerhout (1967) cites an additional advantage of contact lenses, that of an increased retinal image size for the myopic athlete. Small changes in acuity and detail can create large improvements in an athlete's performance.

With the development of the hydrophilic or "soft" contact lens more and more athletes are giving up their spectacles. Soft lenses hold several advantages over the conventional PMMA lens in that they are more comfortable, have a reduced adjustment period, and being larger they adhere to the eye more securely.
resulting in fewer losses. An article by Raymond Berry (1975) exposes the insecurity of the lens wearing football player as he lines up against a 230 lb. defensive player. 'Soft contacts have now alleviated at least the insecurity of the lens falling out.

As PMMA lenses are known for their ability to get debris between themselves and the eye, they require more frequent removals during a sports activity than a soft would. Soft lenses have a larger optical zone than the standard PMMA lens which results in less flare and a wider field of view. Flare can be a very detrimental consequence of a hard lens, especially for those athletes playing under lights at night.

PMMA lenses do offer something that the hydrophilic cannot. That very important something is actual physical protection of the athlete's cornea. Rengstorff and Black (1974) cite three separate accidents in which the victim's sight was perhaps saved by a PMMA contact lens. Two of the accidents involved college football players whose eyes fell victim to football shoes in the course of tackles. One player sustained a concussion and facial contusions while the second player got away with lacerated eyelids. In both of these accidents numerous scratched were found on the contact but no damage was done to the cornea. The third accident was a finger into the eye of a professional football player who was wearing his PMMA lenses. In this case there was no damage to either the contact or the cornea.

Fitting philosophies for contacts have changed to include the newer hydrophilic lenses and to more or less exclude the
scleral lenses. The scleral lenses did have their own advantages for their time and some are still valid over the PMMA and the soft. They are fit under the eyelids and could not fall out of the eye. They also protected the entire eye from a blow, dust, wind discomfort and offered minimized glare. But by their construction the comfort overall was much less than desired and could be worn for only very short time periods, (Firestone, 1976).

As the corneal PMMA lenses became more common the scleral lens slipped into obscurity resurfacing mainly as a medical or special protective device. The corneal lens is successfully used in sports by fitting them smaller and tighter. This lens should be removed after the game to avoid corneal abrasions and the comfort is usually decreased. Central fenestrations are often added to increase the venting of the lens. Despite the fitting alterations the lens is still subject to jarring upon very hard impacts, and loss is still quite common.

Now, with the development of the hydrophilic lens and the toric softs, most of the athletes can wear these with little of the concern the two previous types of lenses caused. The fitting philosophy for the soft lenses is basically the same as for the nonathlete and these lenses may be worn constantly before and after the sporting event with no discomfort.

Koetting's research in 1974 found that contact lenses are fit more for football than any other sport in the United States. He attributes this to the confinement of the helmet and the frequent adverse playing conditions. The second sport on his list was basketball. In this sport there are no adverse environmental
conditions, so hard and soft lenses may be worn comfortably. The bulkiness of spectacles does make a difference here in the crunch under the basket for rebounds and may sometimes prove to be dangerous. He also found the lens of preference in baseball to be the hydrophiliic due to the dust and winds of the summer.

**VISUAL TRAINING AND SPORTS**

Once an athlete has an adequate refractive correction, he can begin to utilize his visual skills to their fullest. If a player's vision isn't up to par, his performance will be lacking also. Vision training can improve an athlete's faulty visual skills and enhance those which are adequate.

One category of visual skills which have had some attention in the literature are ocular motilities—saccades, pursuits and rotations.

Trachtman (1973) found a correlation of +0.44, significant beyond the 0.01 level, to exist between ocular motility (pursuit and saccade movements) and batting averages of Little Leaguers. Pursuit movements considered alone were found to have a significant correlation with batting averages.

Falkowitz and Wendel (1977) did a study on 50 Little League baseball players and found the players with higher batting averages had significantly superior rotations, saccades, and pursuits. They also discovered the better players had near points of convergence between two inches and their eyes, and did not have crossed hand-eye dominance. The pair reported that the ten players with the worst batting averages had jerky fixation movements, over- or
under-shooting on their saccades and an increase in head movements. These studies indicate a relationship between ability to fixate and follow an object and batting averages.

In his book *Six Weeks to a Better Level of Tennis*, Raiston (1977) a former #1 ranked U.S. tennis player, states "Among the better players, you see less head movement. Good players invariably let their eyes do the tracking of the ball much more than their heads."

Blanton Collier (1979), former coach of the Cleveland Browns football team, believes that the "eyes lead the body" and that all great guards looked toward their next direction of movement before they stepped. He found that precise fixation on a moving target was critical for his passers.

Sherman (1980) wrote about Dr. Revién, who, while working with players from the New York Sandlot Baseball Club, trained the visual skills of one group of the players. The trained players had much fewer strike outs than those who had not been trained.

Pursuits, saccades and rotations can be easily trained by optometric means and the improvement of these skills has been shown to produce better athletic ability.

The quality of ocular motilities is, in part, affected by the clearness of the object being observed. To enable an athlete to follow the flight of a ball and see it clearly, precise accommodative function is required. The focusing ability of an athlete's eyes should be tested and therapy for remediation ensue if the skill isn't up to normal (Tieg 1980).

"Difficulties in the accommodative/convergence system will create problems in accurate localization and in being able to keep the eyes on the ball." (Setz 1978)
Techniques for treating accommodative dysfunction are well known by optometrists and relied upon for favorable results.

When a moving target is observed or an athlete is in motion himself, factors of static origin (such as visual acuity) lose some importance. A little tested but very essential visual skill in athletics is dynamic visual acuity.

Beals et al. (1971) showed dynamic visual acuity to be highly correlated with free throw shooting ability of college basketball players.

White (1977) discusses dynamic acuity as the most important visual ability of all. He evaluated the seldom tested attribute with a Kirshner Oculo Rotor and found many athletes to be lacking.

In an article reviewing the literature which pertains to the vision of athletes, Gregg (1977) summarizes by stating, "The dynamic factors seem to be the most significant."

Reaction time is directly related to static and dynamic visual acuity. (Getz 1978)

On the playing field/court an athlete must make split second localization, decisions, and movements. Good eye teaming, accurate accommodative and convergence skills, and fusion are necessary if the player is to realize full visual potential.

Getz (1978) performs a complete visual analysis on all sports enthusiasts. Fusion is tested in all direction of gaze and in all points in space. The superior gaze position is given careful consideration. This position is especially important for outfielders and shooting baskets. Fusion tests suggested by Getz are anaglyphs, polaroids, and striated lenses. Getz believes fusion
should be tested under conditions of dynamic balance (i.e., in conjunction with a balance board, trampoline, etc.).

SILO effect (small in, large out) is tested to assess the quality of binocularity. Speed of binocularity is also important to obtain for quick localization decisions. Accurate localization is ascertained through Brock string, anaglyphic and polaroid methods.

Etting (1977) also feels that fusion tests, SILO, and quality of fusion under out of balance condition are essential parts of an optometric evaluation of an athlete.

Lewis (1974) discussed a former high school All-American basketball player whose shooting percentage dropped drastically. As a pre-med student, the intense near work was causing eso a far and a shrinking of distance vision. Near point plus lenses, accommodative training, and Brock string were implemented, and a marked improvement in the player's performance occurred. Later in his career he was a #1 draft choice with the ABA and #2 with the NBA.

Good eye teaming is an important requirement for fine depth perception judgements. Sherman (1980) writes: "The ability to perceive depth is highly dependent upon binocular vision and muscle balance. Preciseness of eye muscle coordination from innervational patterns leads to precision of movements allowing the organism maximum sensory output to get the information necessary to perform the task."

Results of studies relating depth perception and athletic ability have produced conflicting results. Athletic performance and depth perception have been found to be positively correlated
by Graybiel (1955) and Olson (1956). Negative results were found in free throw shooting by Shick (1971) and Dickenson (1953). Gregg (1977) showed no relationship existed in basketball.

In his sports vision research summary Gregg (1977) states, "Murphy at Iowa State University and Montebello at Ohio State University reported greater sensitivity to depth perception on basketball players and Murphy concluded that "perception of distances probably is an important factor in successful basketball shooting."

Getz (1978) concludes that quality and speed of stereopsis are most important; they determine how quickly a person grasps visual information.

Stull (1960) performed a study on basketball players utilizing eye patching varying dominant and non-dominant eyes during practice sessions. His conclusions were: 1. There is a slight change in the pattern of shooting when the players were forced to use their non-dominant eye. 2. Monocular sighting by either the dominant or the non-dominant eye may be equally successful, and, 3. The probability of experienced players relying on fine monocular sight sighting is greater than those relying on binocular vision.

Other visual abilities have been cited in research including peripheral vision and visualization. Again, results of studies are inconclusive.

Deshaies and Pargman (1976) found no significance between varsity and JV football players in the skills of depth perception, horizontal and vertical peripheral vision or visual disembedding.

Peripheral vision was found to be highly related to athletic
performance by Graybiel (1955), Stroup (1957) and Williams and Thiare (1975) who also state that peripheral vision increases with training. Tieg (1980) and Getz (1978) suggest work with tachistoscopic training and/or an arc perimeter to improve peripheral awareness. Ghosh (1973) explains how ophthalmologists perform peripheral enhancement on basketball players. Koch (1949) reported that training to increase the size of the visual field, improve kinesthesis, and improve perception, all resulted in better athletic performance.

Blanton Collier (1979) says that good peripheral vision is needed for football quarterbacks to enable them to spot second receivers, sidestep linemen, and throw away from opponents. When a coach says a player has "poor hands" actually he means poor eyes. (Getz 1978)

Visualization seems to be an extremely important skill of athletes. Jacobsen (1959) discovered that muscles which performed an activity showed electrical activity when the person imagined doing the task. Richardson (1969) studied the effects of visualization on the free-throw scores of basketball players. A group of players who only visualized free throw shooting experienced higher increases in performance than those who did much practicing.

Williams C. Lee (1977) emphasizes the role of visualization in his sports vision—VT practice. He helped Sharon Walsh, a professional tennis player to improve her visual skills and consequently, as she believes, improve her game.

Blanton Collier also puts emphasis on visualization, but he
feels the better players always have eyes on the ball because if
eyes wander, he reasons, body follows and gets out of position.

Maddox (1977) believes that visualization is one of the
most important skills an athlete can possess. The player must
learn to "tune into the right channel".

Getz (1978) discussed some characteristics of athletes who might
benefit from visual training. Those who are inconsistent, athletes
whose performance deteriorates under stress, or players who perform
less satisfactorily when out of balance may all have visual
problems requiring optometric attention. White (1977) also lists
inability to concentrate as a symptom which may have a visual
cause.

Etting (1977) feels that characteristics signalling a visual
problem include deterioration of performance with duration of
activity, performance not matching natural potential, and performance
adversely affected by intermittent blurring or doubling.

As to specific sports, Etting organized symptoms as follow:

A. Basketball:

1. Ball handling difficulties.
2. Frequently charging, running into opponents, stealing
   ball from his own teammates.
3. High rate on turnovers.
4. Poor ability to find open man when he has control of the
   ball.
5. Poor free thrower.
6. Can shoot well only from certain distances or positions
   on the court.

B. Football:

1. Poor hands (regarding receiving ability). When says
   "hands", really means "eyes".
2. Drops passes in crowd.
3. Quarterback who has trouble finding open receivers or reading defense formations, and needs excessive time to set up.
4. Inability on defense to be where the ball is.
5. More trouble catching on the run than when stationary.

Lee (1977) emphasizes that the ..."visual system provides information for performance in the majority of sports... also the information for judging when to perform".

Getz (1978) promises many good results to vision training. In basketball he says the athlete will show better field goal and free throw percentages, fewer turnovers, more assists, a greater shooting range, more playing time and fewer charging fouls. Baseball improvements include higher batting averages, higher fielding averages, and fewer strike outs. Football players will develop their skills and become better ends, quarterbacks and defensive backs.

The above studies by Getz, Etting and Lee all state that athletes are enthusiastic about visual training programs and feel it significantly improves their performance.

The intent of this paper is twofold. First, it attempts to assess the present level of optometric involvement in sports vision. Secondly, we wish to determine the present useage of optometric services by sports teams.

By comparing these two areas we will be able to determine whether there is a need for more optometrists to become involved in sports vision.
PROCEDURE

Seventy-two short answer questionnaires were mailed to the trainers of professional sports teams across the country (see Appendix A for copy of the questionnaire). Of these, 22 were sent to pro-basketball, 25 to pro-baseball, and 25 to pro-football teams. Trainers were chosen as they usually stay with professional teams longer than the coaches and are more aware of the player's personal health. The surveys concentrated mainly on the topics of contact lenses and visual training and the usage of these in the sport responding.

For comparison 75 colleges were selected at random from Webster's Collegiate Dictionary. College enrollment and town size were varied. The surveys were directed to a certain sport (either football, basketball, or baseball) through the athletic department at each school. Due to the varied personnel at different schools this was deemed the best route of distribution.

To gauge the optometric opinion in the field, separate questionnaires assessing interest, income gained from athletic programs, and philosophies concerning optometry and the athlete were mailed to practitioners (see Appendix A for copy of the questionnaire). Two optometrists from each state were selected at random from the Blue Book of Optometry.

The answers received were tallied in their respective categories and questions from the three surveys were correlated for an over-all view.

The data was placed in tables and studied for connections with college size, town size, O.D. vs. M.D., and the potential for increased optometric participation in sports vision.
RESULTS

Surveys were mailed to 100 optometrists of which 64 were completed and returned. Of those 64 optometrists, six (or 9.4%) are presently serving as vision consultants. Two OD's are consultants to high schools, two to collegiate programs, one to both levels, and one OD did not specify.

Comparing the optometrists serving as consultants to the size of their community showed no correlation. See Table I.

TABLE I- Optometrists serving as vision consultants compared to community size.

See Appendix B for a further breakdown of this question.
Four optometrists contribute their services voluntarily while two are compensated monetarily.

Eighty-five percent of the OD's answering feel there is a potential for optometric growth in the field of sports vision. There was no significant correlation between the size of the community where the OD practiced and his view on this matter. See Table II.

TABLE II- OD's believing in a potential for growth of Optometry in sports vision compared with their community size.

The major areas in which the optometrists felt expansion was in order are: 1.) Advisory/Consultant (11) 2.) Visual Training (9) 3.) Contact Lenses (6). For other areas of interest
to optometry see Appendix B.

Seventy-five percent (46 of 61) considered the athlete separately when prescribing corrective lenses. This correlated inversely with the size of the community in which the OD practiced. See Table III.

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<th>Population of Community</th>
<th>Percent</th>
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<td>&lt; 5,000</td>
<td>100</td>
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<tr>
<td>5,000-10,000</td>
<td>75</td>
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<tr>
<td>10,000-25,000</td>
<td>50</td>
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<tr>
<td>&gt; 25,000</td>
<td>25</td>
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TABLE III—Optometrists prescribing separately for the athlete compared to the community size in which they practice.

The major areas of concern for the athletic patient were contact lenses and sports frames. For others see Appendix 3.
Ninety-three percent of the optometrists responding to our survey prefer to prescribe contact lenses rather than spectacles in several sports. Eighteen OD's said they prefer to prescribe contacts for athletes participating in any contact sport. Of those specifying a particular sport, football and basketball were most often listed. For reasons of the OD's who preferred contacts see Appendix B.

Optometrists were asked if they include visual training as an eye-care service to athletes. Sixteen of the 64 OD's responding replied positively. Putting the yes answers into town size comparisons, we found that cities with over 100,000 population and those with under 5,000 population have the largest percentage of practitioners offering visual training. See Appendix B for the role and techniques (types of training) preferred.

Surveys were sent to 75 college teams and 72 professional teams. We received 27 of each, completed. Of the pro teams responding, nine of the 27 have vision consultants. Of the college teams responding, seven of the 27 have vision consultants. A significant difference was found between the pro and collegiate teams in that six of the seven college consultants are serving voluntarily, while seven of the nine pro consultants were directly on the payroll. See Table IV. Colleges with an over 10,000 student enrollment were most likely to have a vision consultant, but the figure is still less than half. See Table V.

Professional sports teams showed a preference for MD consultants (6 of the 9 consultants). On the other hand most
of the college consultants were OD's (4 of 5). One team utilized the services of both an OD and an MD.

TABLE IV- College and Professional teams utilizing vision consultants

TABLE V- LEFT Percentage of colleges having vision consultants compared to their enrollments
Ten of the 27 college teams (37%) surveyed have screening programs while 78% of the 27 pro teams responding had some type of a screening program. The screenings consisted mainly of Snellen wall-chart acuity determinations though one or two incorporated depth perception, reaction time, and color tests. No difference was found between football, basketball, and baseball teams. Colleges with enrollments over 10,000 students are much more likely to have a screening program for their athletic teams. See Appendix B. The percentage of athletes failing the screenings was 1-4% for the college and pro teams answering our survey. See Appendix B.

When colleges were asked if they recommend contact lenses for their athletes the responses varied considerably from sport to sport. Twenty-five percent of the baseball teams and 33% of the basketball teams recommended contacts. One hundred percent of the football teams recommended contacts over spectacles. In the professional sports the major preference for contacts came in basketball and baseball, with only 57% recommending them for football. See Table VI.

Soft lenses were generally preferred over hard contact lenses for nearly all sports, both college and professional. Pro basketball was the only sport in which the results pointed to neither hard or soft as a preference. Pro baseball and football were almost equally favorable toward soft lenses. College football was more skewed to soft lenses than the other two college sports surveyed. See Appendix B for data.
TABLE VI - Percentage of college and professional sports teams which recommend soft contact lenses.

The most frequent problems observed with contact lenses by the teams were loss (14 pro, 12 college) and irritation (8 pro, 12 college). See Appendix B for other problems.

Seventy-five percent of the professional teams kept extra contact lenses on hand for their players (18 out of 24) while colleges reported only 36% (8 of 22) had this service. The most extra lenses were kept for college football while pro teams kept the most for basketball. See Table VII. Larger colleges had the highest percentage of teams keeping the extra lenses for their players. See Table VIII.

One hundred percent of the professional teams reported that there was someone knowledgeable to remove a contact lens from the eye of an injured player. Of these persons, 80% were trainers, 19% were doctors, and 1% were coaches. In the college
TABLE VII- College and pro teams keeping extra contact lenses on hand for players.

TABLE VIII- College size and the practice of keeping extra contacts for players.
ranks 86% of the teams had someone who knew how to remove a contact lens. Of these people 75% were trainers, 21% were doctors, and 4% were coaches.

In the area of visual training our survey showed that few teams are presently utilizing this therapy. Significantly more pro teams than colleges utilize it, however. See Appendix B. Professional baseball teams utilize visual training more than any other group surveyed. The benefits obtained due to visual training were reported as: 1.) better eye-hand coordination, and 2.) increased shooting percentage. Both remedial and enhancement training were reported as being used.

DISCUSSION

Although the optometrist survey was based on a small sample it indicates that the size of the community does not correlate well with the opportunity of becoming a vision consultant. It showed that there are available opportunities in both high schools and colleges for the vision consultant. None of the OD's surveyed were serving as consultants to professional teams. The number of opportunities favor high school and college level programs due to the limited number of professional sports teams in the United States. However, if you are searching for a spot on the payroll the chances are much better on the staff of a pro team or a large college (probably due to the availability of money for the athletic departments). The small percentage of colleges and even pro teams utilizing vision consultants combined with the high percentage of OD's
expressing interest and concern in this area demonstrates an unmet need which could prove rewarding for the optometrists wishing to pursue this aspect of the field.

Even with more people becoming involved in the area of sports vision there still exists confusion. One trainer illustrated his lack of understanding in this area by his answer to the question, "Does your team have a vision care specialist?"

His reply was, "No, just an ophthalmologist."

When the optometrists were asked if they prescribed for the athlete with special consideration the results showed the most attention given to those athletes living in smaller communities. This could be due to the time available to spend with the patients in a small community vs. a larger city or even to the emphasis placed on sports in the towns of different sizes.

Studies have reported a 20-30% failure rate for college athletic screenings. The percentage failed was reported to be much lower (1-4%) for the college and pro teams replying to our survey. Either the question was not fully understood or the screenings conducted are not picking out the people who really are in need of visual care. On the reverse side of the printed survey a trainer from Marquette University commented, "This is a collegiate institution—problems requiring vision correction have been picked up at an earlier date."

This type of ignorance must be dispelled. There is definitely an unmet need for visual screening programs, especially
in the smaller colleges. Many of the screenings conducted are inadequate, and important visual skills are not being tested, let alone a reliable near and far visual acuity. If money can be allocated at the collegiate or professional sports level for this service, a tremendous opportunity will exist for OD's to upgrade and improve the visual screening of athletes.

It is evident that optometrists are in favor of contact lenses over spectacles especially in those sports with a great deal of bodily contact. Sports teams do not consistently recommend contact lenses to their players, although a large number of players are now wearing contacts for sports. The total number of those utilizing contact lenses would probably increase if teams recommended their use. Therefore, the optometrists should spend 

more time emphasizing the benefits of contacts, both in vision and safety, to the staffs and players. The advantages of the soft lenses should be explained also, and the usage increased when possible.

At present, few optometrists recommend and few teams utilize visual therapy. Research has shown however, that significant benefits can be derived from this type of training. If optometrists can convey the gains which can be realized from visual training to coaches, trainers, and concerned parents, many opportunities could open to practitioners interested and competent in this area of vision care.
APPENDIX A
Pacific University College of Optometry is conducting a survey of sports teams on the college and professional levels to determine the present and potential roles of vision care specialists in this area.

A short questionnaire is enclosed to be completed by either the coach, trainer, or vision care specialist as is appropriate. Please return this via the self-addressed envelope closed as soon as possible. Your cooperation and assistance is greatly appreciated.

Norm Stern, O.D., Ph.D., advisor
Doug Barton
Karen Ruckel
Laureen H. Link
Sports Vision Survey

Please circle yes - no or fill in the blanks as necessary; use back when needed.

<table>
<thead>
<tr>
<th>Name</th>
<th>Sport</th>
<th>Position on Team:</th>
<th>Phone</th>
<th>Trainer</th>
<th>Vision Care Specialist</th>
<th>Other</th>
</tr>
</thead>
</table>

1. Is there a vision care specialist on the payroll?   Yes   No
   If so - what title does he/she hold (O.D., M.D., etc.)
   If so - how has the team benefitted?

2. Does your team utilize a vision screening program?   Yes   No
   If so - what percentage of players screened failed visual requirements?
   If so - what were the criteria for passing?

3. What percentage of players requiring visual correction are wearing contact lenses?
   Of those, what is the ratio of hard to soft lenses?

4. What are the most frequent problems with contact lenses?  i.e., loss, glare, irritation due to playing conditions, etc.

5. What is the ratio of full-time contact lens wearers to those wearing their lenses only for the playing time and practices?

6. Are there extra contact lenses kept for each of the players in case of loss or damage to the lens?

7. Is there someone knowledgeable to remove contact lenses from an injured player? If so - who?

8. Are contact lenses recommended over spectacles for participation in this sport?   Yes   No

9. Do you use visual training (therapy) in your program?   Yes   No
   If so - is the VT for remedial work or for visual enhancement?  i.e., hand-eye coordination, tracking skills, etc.

   If so - what techniques are used for what problems?

   If so - have individual or team improvements been noted?   Yes   No

   What are these improvements if any?
Pacific University College of Optometry is conducting a survey of optometrists across the country to determine the present and potential roles of the profession in the area of sports vision.

Please complete the short questionnaire below and return it via the self-addressed envelope enclosed as soon as possible. Your cooperation and assistance is greatly appreciated.

Sports Vision Survey

Please circle yes - no or fill in the blanks as necessary; use back when needed.

1. Are you presently serving as a vision consultant to a high school, college, or professional sports team?
   Yes  No
   If so, name the team level, and describe your obligations: ________________________________
   If so - are you on the payroll or is the program voluntary? ________________________________

2. Do you feel there is a potential for optometric growth in the field of sports vision? Yes  No
   If so - how? ________________________________

3. In your practice do you consider athletes separately when prescribing for the high school or college student? Yes  No
   If so - please give an example ________________________________

4. Do you prefer prescribing contact lenses vs. spectacles in certain sports? Yes  No
   If so - what sports and why? ________________________________

5. Do you suggest and utilize visual training (therapy) for athletes? Yes  No
   If so - are the techniques used mostly for remedial training or visual enhancement? ________________________________

2043 College Way, Forest Grove, Oregon 97116
Telephone (503) 357-6151
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Sports Vision Survey

Please circle yes - no or fill in the blanks as necessary; use back when needed.

1. Are you presently serving as a vision consultant to a high school, college, or professional sports team?
   Yes  No  If so, name the team level, and describe your obligations:

   If so - are you on the payroll or is the program voluntary?

2. Do you feel there is a potential for optometric growth in the field of sports vision?  Yes  No
   If so - how?

3. In your practice do you consider athletics separately when prescribing for the high school or college student?
   Yes  No  If so - please give an example.

4. Do you prefer prescribing contact lenses vs. spectacles in certain sports?  Yes  No  If so - what sports and why?

5. Do you suggest and utilize visual training (therapy) for athletes?  Yes  No  If so - are the techniques used mostly for remedial training or visual enhancement?
APPENDIX B
I. Answers to the question for the Optometry Survey, "Are you presently serving as a vision consultant to a high school, college, or professional team?" compared to size of community.

<table>
<thead>
<tr>
<th>City Population</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>5-25,000</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>25-50,000</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>50-100,000</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

II. Areas in which the optometrists surveyed feel there is a potential for optometric growth.

<table>
<thead>
<tr>
<th>AREA</th>
<th># REPLYING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory/Consultant</td>
<td>11</td>
</tr>
<tr>
<td>Visual Training</td>
<td>9</td>
</tr>
<tr>
<td>Contact Lenses</td>
<td>6</td>
</tr>
<tr>
<td>Sports Frames</td>
<td>3</td>
</tr>
<tr>
<td>Peripheral Vision</td>
<td>2</td>
</tr>
<tr>
<td>Team Optometrist</td>
<td>2</td>
</tr>
<tr>
<td>Screenings</td>
<td>1</td>
</tr>
<tr>
<td>Recreational Sports</td>
<td>1</td>
</tr>
<tr>
<td>Stereo Vision</td>
<td>1</td>
</tr>
<tr>
<td>Better design of uniforms and equipment</td>
<td>1</td>
</tr>
</tbody>
</table>

III. Areas in which optometrists consider athletics separately in their own practices.

<table>
<thead>
<tr>
<th>AREA</th>
<th># REPLYING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Lenses</td>
<td>14</td>
</tr>
<tr>
<td>Sports Frames</td>
<td>13</td>
</tr>
<tr>
<td>2nd pair of lenses</td>
<td>2</td>
</tr>
<tr>
<td>Visual Skills</td>
<td>2</td>
</tr>
<tr>
<td>Impact Resistant Glasses</td>
<td>1</td>
</tr>
<tr>
<td>Ocular Protection</td>
<td>2</td>
</tr>
</tbody>
</table>
IV. Reasons why optometrists prefer to prescribe contact lenses for athletes.

<table>
<thead>
<tr>
<th>REASON</th>
<th># CITING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider Peripheral view</td>
<td>20</td>
</tr>
<tr>
<td>Less of a Hindrance</td>
<td>12</td>
</tr>
<tr>
<td>Spectacle Breakage</td>
<td>11</td>
</tr>
<tr>
<td>Sweat on Glasses</td>
<td>7</td>
</tr>
<tr>
<td>Better Acuity</td>
<td>4</td>
</tr>
<tr>
<td>Better Tracking of Moving Objects</td>
<td></td>
</tr>
</tbody>
</table>

V. Percentage of optometrists recommend or utilizing visual training compared to the population of the community in which they practice.
VI. Visual Training techniques utilized by optometrists who train athletes.

<table>
<thead>
<tr>
<th>TECHNIQUE</th>
<th># WHO UTILIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accomodative Rock</td>
<td>1</td>
</tr>
<tr>
<td>Hand-Eye Coordination</td>
<td>2</td>
</tr>
<tr>
<td>Pursuits</td>
<td>2</td>
</tr>
<tr>
<td>Gen Binaocular Training</td>
<td>1</td>
</tr>
<tr>
<td>Depth Perception</td>
<td>1</td>
</tr>
<tr>
<td>Far-Near Saccades</td>
<td></td>
</tr>
</tbody>
</table>

VII. Percentage of colleges who enact a screening program compared to the size of their enrollments.
VIII. Percentages reported by college and professional teams of those athletes who failed their screenings.

<table>
<thead>
<tr>
<th>College</th>
<th>Percentage Failed</th>
<th>0%</th>
<th>1-4%</th>
<th>5-10%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of Replies</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional</th>
<th>Percentage Failed</th>
<th>0%</th>
<th>1-4%</th>
<th>5-10%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of Replies</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

IX. Ratio of Soft lens wearers to the sum of hard+soft contact lens wearers in college and professional football, basketball, and baseball.

<table>
<thead>
<tr>
<th>College</th>
<th>Percentages (Soft/Soft+Hard)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Basketball</td>
<td>2</td>
</tr>
<tr>
<td>Football</td>
<td>5</td>
</tr>
<tr>
<td>Baseball</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional</th>
<th>Percentages (Soft/Soft+Hard)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Basketball</td>
<td>2</td>
</tr>
<tr>
<td>Football</td>
<td>5</td>
</tr>
<tr>
<td>Baseball</td>
<td>5</td>
</tr>
</tbody>
</table>
X. Percentage of teams which utilize visual training service as part of their eye-care.

<table>
<thead>
<tr>
<th>College Teams</th>
<th>Professional Teams</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Percent</th>
<th>Yes</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sport</th>
<th>Football</th>
<th>Basketball</th>
<th>Baseball</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


44. Fieg, Donald. Sports Vision Care: the Eyes have it. 51(7) 671-674 July 1980.


