Sports vision: What and how to prescribe ophthalmic products.

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**Introduction:**

The changing face of sports from the old conservative amateur approach to a dynamic professional business has created many opportunities. The unprecedented interest of the media and the globalization of television and the internet have made sports a major marketing tool. Like elsewhere in the world athletes and coaches are investigating all the different legal (and sometimes illegal) options available to them to enhance performance and give them that edge over their competitors. This resulted in organisations identifying what is called key performance indicators. Sports vision is regarded as one of these indicators (Ferreira 2014, 2018).

The role of vision in sports performance is a topic that has always attracted considerable attention and has been studied quite extensively over the years. Quite recently statements and announcements made by a number of high profile professional sporting organizations and individuals on the contribution of sports vision to their success certainly resulted in even more public awareness.

In 1986 the following definition was formulated: Sports vision encompasses performance orientated comprehensive vision care programs involving the education, evaluation, correction protection and enhancement of the athlete. Each of these areas should be addressed in a performance oriented manner. This means that the practitioner should consider all his or her services from a performance standpoint. Improved visual performance resulting in enhanced athletic performance must be the ultimate goal of sports vision regimens (Reichow and Stern, 1986). Judging from all the enquiries I am receiving from optometrists there is indeed a keen interest to be involved in this discipline with the biggest market being the recreational athlete and children.

Most studies on sports vision still originates in the disciplines of sport science and sport psychology. In optometry it seems that behavioural optometry has claimed it as part of their domain and that is certainly scaring away the more traditional optometrist. The reality is that Optometry is the only professional that can provide the whole range of sports vision services. Sherman (1986) already referred to the unique role that optometry can play in providing sports vision. He stated that the optometrist routinely provides vision care to athletes at different levels and this care should include corrective eye wear, protective eye wear and visual training to reinforce the role of optometry in enhancing sports performance. Furthermore, the notion that sports vision is only for the elite athlete is definitely not true and as mentioned before most potential patients are children and the casual athlete.

Optometry is indeed the only provider for corrective and protective eye wear, while testing and training are also done even by people with sometimes very little training or education. All optometrists could (should) be able to provide corrective and protective eye wear. It only takes a different mind-set, knowledge of product ranges and a sound knowledge of the different sporting codes to understand the different demands and limitations for a given sport. In many sports correction and protection goes hand in hand. You cannot just think correction without considering protection (Ferreira, 2014).

Recent experiences prompted me to write this article. I saw several patients that are recreational squash players wearing semi rimless frames. In a game like squash it is not the ball but the opponent’s racket that is the main cause of ocular injuries and wearing semi rimless frames create serious risk of ocular injuries. I am sure that this was not done deliberately but the issue of participating in sport was not addressed in the patient’s case history. More than 90% of people needing a prescription for sport are recreational athletes and not knowing this will put your patient at risk. Too often we concentrate on the few patients that are professional athletes. Doing a proper case history to find if the patient do participate in sport is non negotiable.

To understand peoples’ needs and the options available to you requires an intimate knowledge of the particular sport. On a recent conference I mentioned the fact that one of the sports responsible for the most ocular injuries in the USA, is angling and people laughed. Soon after I received a mail from someone that just saw such a case.

The aim of this article is therefor to revisit the relevant principles involved in prescribing corrective and protective eye wear for people participating in sport. The greater involvement of optometry and ophthalmology in sports vision research during the 1970’s was also guided by two other aspects. First of all the significant progress made in the development of soft contact lenses resulted in contact lenses becoming the primary visual correction for athletes. According to Lieblein [14]a survey done by Bausch & Lomb in 1977 found that 86% of professional baseball, football, basketball and ice hockey players needing vision correction used contact lenses. More than 50% of them used soft contact lenses. During the late 1980’s a series of articles appeared describing considerations for fitting athletes for specific sports [14, 15].

The second aspect concerned awareness of the risk of eye injuries in sport and about the role primary care practitioners play in the prevention of such injuries through education and the provision of protective eyewear. Vinger [17],in a study on ocular injuries in ice hockey players, and Vinger & Tolpin[18] in a study on racket ball players drew attention to the incidence of serious eye injuries in sport. They were amongst the first to recognize that eye injuries in sports pose a substantial but preventable risk. Estimates on the type and number of ocular injuries due to sports have largely been retrospective in nature and based on emergency room statistics or on information collected at large eye hospitals in the USA. These estimates may be as high as 100,000 eye injuries each year [19, 20]. With the emphasis on prevention of such injuries, several studies reported on the use and development of eye protection standards [21] and also resulted in a position statement by the International Federation of Sports Medicine [22]. This report provides guidelines for routine visual examinations, the identification of eye injury risk factors in sports and the factors to consider when prescribing corrective and protective eyewear for sports. Vingerprobably has done more than anybody else to promote eye safety in sports and he was the driving force behind most of the efforts to test and develop eye protectors and produce universally acceptable safety standards. His original study published in the well-respected Duane’s Clinical Ophthalmology in 1985 has later been updated by Vinger [23] himself.

**The case history:**

Effective patient counselling begins with a thorough case history to determine specific needs. Factors such as gender, age and level of participation should all be considered. Comprehensive education and recommendations on the use of various products will establish the practitioner as a valuable resource (and will ensure that your patients return to you). The athlete should be guided to make an informed decision about the best option for his or her individual needs. If spectacles are an option, the athlete should be counselled on the best lens characteristics, frame designs, tint characteristics and protection factors Erickson, 2007).

Each sport presents with its own visual requirements and demands and it is important to understand this before making any recommendations on visual correction and or protection. It is common practice to start off by dividing sports into contact and non-contact sports and you will find this even in optometric literature (Loran and MacEwen, 1995, Erickson, 2007). Ferreira (2014) clearly showed this kind of risk assessment to be totally inadequate in the world of sports vision. The angling incident referred to before serves as a prime example of this. Therefor we need to follow a different approach in optometry when we consider the nature of the athletic activity and environmental factors that may come into play.

**Nature of the sports activity:**

The practitioner is obliged to consider and analyse the specific sports activity to first of all understand the rules of the sport. Certain sports prohibits the use of spectacles while others may demand the use of protective eye wear.

 **Environmental factors:**

Erickson (2007) has made a whole list of the different environmental factors that should be considered. These factors also include the need to protect against ocular injuries. I have included several examples to assist the practitioner in his or her evaluation.

* **The presence of ocular hazards.** This include all racket sports such as squash, tennis, badminton and also other sports such as ice hockey, hockey and cricket. Remember quite often it is not the ball or puck but the stick or racket that is responsible for ocular injuries. You should now also include angling on this list since it has recently been named a the second highest risk sport for ocular injuries in the USA Hoskin et al, 2015 Mountain biking, Cross country biking and Cross fit also forms part of this list.
* **The need for protection from impact for the eye, face and head.** This is mostly associated with contact sports such as rugby, boxing, oriental arts and American football but also quite applicable in non-contact sports as mentioned above. This aspect emphasizes the need to know the rules of the specific sports activity. Many sports in the USA allows for protective head gear or goggles and in sports such as ice hockey, racket ball and American football it is even compulsory. Sports where it is not compulsory such as baseball and angling are now reporting the highest number of ocular injuries Hoskin et al. Sports emanating out of Europe were very slow in their awareness of ocular injuries. Take cricket for example: For many years batsmen were allowed to wear groin guards but it is only recently that they allowed protective head gear. It is still not compulsory and it is not only batsmen but also players fielding close to the wicket that should be included. The current coach of the SA Proteas, Mark Boucher is a classic example where his was hit on the eye by a bail from the wickets and caused ocular contusion and permanent scarring and damage to his one eye
* **The need for protection from solar radiation.** Probably the one aspect all practitioners know about and therefore we sell sunglasses. In a study done in 2003, again with cricket players, Ferreira showed that their choice of sunglasses were determined by – whatever the sponsor provided them with! MOORE, L & FERREIRA (2005) pointed out that there are several considerations required in selecting sunglasses for a specific sport. The most important being impact resistance to avoid ocular injuries.
* **Issues of visibility and mechanical forces with protection.** This aspect relates to the previous one and temples may be replaced by head bands to provide stability. [foto] The aspect of visibility often refers to the density of the tint. Moore and Ferreira, 2001 clearly showed that high density tints may impact on visual evoked responses. Therefor it should be avoided in sports where visual acuity is critical. Another aspect that is often raised is the colour of the tint. I had the opportunity to visit the Adidas factory in Austria and we had a long discussion on this and they admitted to choose colours most people prefer in the European environment and it seems to relate to better contrast. If we take golf as an example: The courses are lush green and brown lenses provided a better contrast. Here in South Africa players seem to prefer grey or green lenses where our environment may often be more brown than green. Notwithstanding this Moore and Ferreira found that choice of tint remains a very subjective issue.
* **Issues with sunlight conditions (variability and glare).** Again relates to solar radiation but requires other considerations if the sporting environment may cause disability glare caused by reflections from flat surfaces. In such cases Polaroid lenses are preferred by most people and will apply to all water sports and all sports where tarred roads, snowy and sandy environments comes into play. Be careful though since these lenses do block out light rays in the horizontal direction it can impact on depth perception. Therefor it is not advisable for sports such as downhill skiing and also for sports where athletes need to get information from LCD displays [boating and cycling] [morgan allaboutvsion
* **Issues with artificial lighting (colour perception and glare)**
* **Temperature issues that may affect ophthalmic products.**
* **Humidity conditions, especially low humidity with contact lens wear**
* **Altitude factors that may affect oxygen transmission to contact lens wear.**
* **Dust and foreign body potential**
* **Sweat, fogging, and precipitation effects with ophthalmic products**
* **The need for product flexibility because of environmental variability.**

Contact lenses offer many advantages in minimizing many of the disadvantages found with most spectacle corrections, specifically poor optics, distortion, lack of safety and comfort.

Patients complain about peripheral vision distortion with safety frames. [foto van so raam] baie individueel

 (How many of you have patients playing squash with rimless spectacles?) Quite often protective eye wear is simply considered as the provision of sunglasses but there is far more too protection than just providing for possible harmful or irritating environmental conditions. Protection against possible ocular injuries is critically important and estimates coming from the USA indicates that sport related eye injuries may be as high as 100 000 each year. (Angling.) Even in the provision of sunglasses a clear distinction should be made between what we call fun glasses (pink, blue or purple lenses), dress wear (typically fashion wear) and performance wear (sport specific products). Thus with a little bit of effort and study and no capital layout every optometrist can provide these services.

Contact versus non-contact sports no collusion and angling.as well as weather and atmospheric conditions that may be encountered by the athlete.

Know your sport.

Sport specific visual demands task analysis

Know products and rules of sport rugby and hockey protection fotos

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SPORTS VISION –HOW TO PRESCRIBE

Introduction:

I often receive requests to lecture on Sports Vision

Gaming is a Sport!!!

Over prescribing

Define vision in sport

Hardware and software skills

Latest technologies

Kyk na my ou lesings

 Contact vs collusion en non contact

Corrective

Protective se 2 elemente – UV en sunglasses

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