

Experience of Family Practice Residents as Athletic Team Physicians

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Providing exposure for family practice residents to all aspects of community medicine is a common goal of training programs. The Antelope Valley Hospital Medical Center Family Practice Program has initiated an innovative project which involves residents serving as team physicians for local college athletic teams. This provides a valuable opportunity for residents to learn skills they can be expected to need in their future practice. The team physician's role offers educational potential for family practice residents through experience with acute orthopedic problems as well as the preventive and psychological aspects of sports medicine. This role also serves as an example of physician responsibility for health-related activities in the community.

More than 20,000 physicians now serve as team physicians or as medical consultants for a team or school system.¹ These responsibilities are almost always assumed on a part-time basis by physicians practicing in the community.² In this way a new family physician may be asked to assume the role of team physician once he/she is in practice. Such an offer is generally attractive, as the work is interesting, often relaxing, and gives a young physician good exposure to build his/her practice. Even if the physician does not assume an official capacity, the participation of youthful patients in athletics will inevitably involve him/her in sports medicine problems.

The increasing responsibilities of this role may find the recently trained family physician inadequately prepared for the demanding decisions required of him.²⁻⁵ Not only will he be asked to assess fitness for participation in athletics and to evaluate and treat injuries, but his advice may also be sought regarding diet, training, conditioning, equipment design, and coaching practices. In addition, there is a need for input from medical professionals regarding the overall design and philosophy of community athletic programs.^{1,4,6}

This paper describes and discusses the educational aspect of a project designed to expose a group of family practice residents to sports medicine through work with college athletic teams. In addition, it discusses the fees generated by this project and proposes that they be used to provide extra educational benefits for the residents.

Scope of the Project

The Antelope Valley Hospital Medical Center Family Practice Residency Program is located in a high desert community of southern California which has a two-year college with an enrollment of

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Table 1. Summary of Positive Responses on Initial History

Concussion	15
Asthma	8
Rheumatic fever	2
Fainting spells	2
Sprains	67
Spine fracture	2
Bee sting allergy	1
Currently on medication	2
Total	99

Table 2. Summary of Positive Findings on Initial Physical Examination

Elevated blood pressure	34
Visual deficit (>20/200)	5
Dental caries	7
Dental appliance	4
Papilloma on tonsil	1
Heart murmur	10
Inguinal hernia	1
Varicocele	1
Hemorrhoids	2
Gonorrhea	1
Ligamentous laxity	15
Skin fungal infection	3
Warts	1
Total	85

6,000 students. The activities of the college include a very successful athletic program for men and women. As part of a contract to provide health care for the college students, it was agreed that four resident physicians would, as a group, serve as the school's team physicians. The residents volunteered to participate in this project. Their responsibilities included preseason health assessment of all athletes, evaluation and treatment of illnesses and injuries, and attendance at all football games.

Prior to the beginning of the school year, instruction was given to the residents regarding the appropriate preseason history and physical examination, disqualifying conditions,⁵⁻⁹ skeletal and

muscular development,^{1,8} psychological aspects of athletic competition,^{3,8,10} and interaction with coaches and trainers.

A staff member of the Department of Athletics, a professional athletic trainer, met with the residents to acquaint them with his role. He also outlined the protocols used by his staff to minimize morbidity in high-risk individuals. Heat stress and its management were also discussed.^{11,12}

The roles of coach, trainer, and physician were defined, and lines of authority over injured players were established at the very outset. The health of the players was at all times the primary consideration, with the physician making the final decision in all cases.⁴

Resident backup and teaching was provided by the Family Practice Center (FPC) faculty, local Emergency Room physicians, an orthopedic surgeon, and the physical therapy department of the Antelope Valley Hospital.

Athletes were required to complete a brief health history questionnaire and undergo a screening physical examination prior to beginning practice. Individuals participating in more than one sport were evaluated only once during the year, prior to the earliest sport in which they took part.

Medical records of each athlete were maintained at the Family Practice Center. In addition, a copy of the initial history and physical examination was kept by the trainers and was available during athletic events. Medical records were audited and results compared with lists of players and injuries kept for insurance purposes by the trainers.

Any positive finding encountered in the initial history and physical examination which required further consideration or investigation by the resident beyond the basic procedure was considered to be of educational value for the resident and is, therefore, included in Tables 1 and 2. These include some conditions which, on further questioning or examination, were found to be insignificant or which, following appropriate therapy, were no longer of major importance to the athlete's health.

Significant injuries during football games were evaluated on the field by the resident attending the game. Other injured players were seen at the Family Practice Center for evaluation by residents or, in a small minority of cases, by a faculty member or nurse practitioner. Players could, if they desired, see other physicians, but they did so

only very rarely. Three athletes (one basketball player, one baseball player, and one from track) were seen by Emergency Room physicians for suturing of lacerations, and one football player was seen by his own family physician for evaluation of an inguinal hernia.

During the course of the year data were collected on the types of injuries and illnesses experienced (Tables 3 and 4), as well as the pattern of encounters and the laboratory and x-ray procedures performed.

Costs of FPC physician services and FPC laboratory tests were included under the basic student health services contract with the college. Additional laboratory and x-ray investigations and the consultations were paid for by insurance coverage carried by the Department of Athletics on its athletes. The athletes themselves paid nothing beyond their basic student fee assessment. A portion of the sum contracted by the FPC for student health services was set aside in a special fund for the residents to be used to defray costs of attending special conferences of their choice.

Results

History Questionnaire

One hundred seventy-two individuals underwent preseason evaluations; these included 25 women. Ninety-nine positive responses on the screening history questionnaire (Table 1) were considered of sufficient importance that the residents investigated (or should have investigated) the response further to determine whether the history was relevant to participation in the sport in question.

Sixty-seven persons (39 percent) had a previous history of ligamentous injury. These athletes were identified by the residents as those for whom appropriate prophylactic taping or padding could be provided. The finding of previous concussion occurred in 15 individuals (eight percent). One of these persons had a history of multiple concussions.

Physical Findings

Eighty-five physical findings initially judged abnormal were noted (Table 2). Most prominent

among these were 34 individuals (29 percent) with initially elevated blood pressure (diastolic pressure of 90 mmHg or greater). One or more repeated blood pressure measurements were performed on these individuals, in some cases at several different times. All but two were shown not to have sustained hypertension. The other two failed to return for follow-up measurements. Heart murmurs were found in ten individuals (8.5 percent). All heart murmurs were considered to be functional on further investigation. Ten persons were also found to have loose ligaments of the knee. Dental caries were the fourth commonest defect and were found in seven athletes (six percent).

The presence of dental appliances, severe visual deficits (worse than 20/200), and ligamentous laxity was called to the attention of the trainers so that appropriate precautions would be taken. Repair of severe dental caries was recommended prior to competition. The impression by a resident of a small inguinal hernia was not borne out on more thorough examination. The incidental findings of urethral discharge, warts, fungal infections of the skin, a varicocele, and a tonsillar papilloma, while not of major importance relative to sports participation, were significant medical problems and were given appropriate management.

No player was disqualified from participation in the particular sport for which he sought approval after appropriate further evaluations or treatments had been accomplished. A differentiation was made between contact and noncontact sports, and several individuals, such as one with a history of a cervical spine fracture and the player with multiple concussions, would have been barred from participation in contact sports. These individuals, however, sought entrance only into noncontact activities, having previously been counseled against contact sport participation.

Injuries and Illnesses

During the mid season the football team was struck by a malady consisting of fever, severe weakness and myalgia, vomiting, anorexia, and nasal congestion. Nearly the entire team was affected over a period of two or three weeks, and 13 individuals sought medical evaluation. Resources were not available to accurately define the cause

of the illness, but it was considered to be a virus. These illnesses served as a dramatic example of the epidemiology of such a disease and its devastating effect on an athletic team.

The medical conditions seen are summarized in Tables 3 and 4 and provide an example of the epidemiology of sports medicine. Injury and illness rates were calculated by dividing the number of injuries or illnesses by the total number of team players in each sport. The number of players on each team who suffered an injury or illness is also given. The total number of athletes for all teams is less than the sum of the individual teams, as some persons participated in two sports. No such athlete was injured in both activities. Fifty-four athletes presented from one to three medical problems per person during the year.

Thirteen injuries occurred during ten football games when residents were present. These included two concussions, one neck injury, four low back injuries, a sprained finger, a badly contused thumb, third-degree ligament tears of a player's knee, a fracture dislocation of the ankle, and fractures of multiple lumbar vertebrae transverse processes. In these instances the resident had the opportunity to actually observe the mechanism of injury, perform an evaluation during the immediate acute stage, and then follow the evolution of the injury through its management and course.

The pattern of demand for physician services revealed that 80 percent of the care delivered went to football players, with utilization paralleling the regular season (August 25 through November 20). Of the 136 encounters for illness and injury, 114 occurred during this period of time. Most injuries and illnesses were managed entirely by FPC personnel. Consultations were obtained from an orthopedic surgeon for eight cases, a general surgeon for two cases, and a urologist for one case.

During the evaluation of the initial abnormalities and the injuries and illnesses during the year, 31 laboratory procedures and 22 radiographs were done. Additional investigations ordered by consultants are not included in these totals. No laboratory procedure was done routinely on individuals judged normal during the initial evaluation.

In the community the prevailing cost of athletic preseason medical evaluation is \$15.00. The illnesses and injuries seen at the FPC would have likely been assessed a brief visit fee, also \$15.00. In previous years, attendance at football games by physi-

cians has been by physician-volunteers from the community. Thus, the total cost of physician services for the project, if paid on a fee-for-service basis, would have been \$4,620, exclusive of consultant's fees. Because these services were provided as part of a general student health contract, it is not possible to identify the actual cost to the college of athletic team care per se.

Discussion

It is advantageous to an athlete to be able to turn to his own family physician for preseason evaluation and treatment of illness and injury.⁸ The family physician possesses a wealth of historical data, perhaps reaching back to birth, about medical problems and prior health. The individual's psychological makeup, response to challenges and stress, compliance with instructions, and response to authority should be well known to his/her family physician. Care of the entire family brings an awareness of the importance attached by the athlete's parents to sports participation and of any problems or stress within the family which may relate to the individual's motivation toward athletic endeavors and response to injury. Also, the family physician's skill in use of consultants and community resources can be brought to bear on the athlete's problems.

The needs of the young athlete, however, go far beyond initial evaluation and treatment of injuries.^{5,6} The family physician who desires to respond to these is obligated to learn all he/she can about the sports programs for youth in his community and to be qualified to give advice about a variety of medical aspects of sports.¹ The physician's involvement should be in establishing proper health policies to ensure the protection of the health of the young athlete. These include provision for proper conditioning, good coaching, capable officiating, proper equipment and facilities, as well as preparticipation evaluation and the care of injuries.^{4,6} The physician should be in a position to exert control over all the medical aspects of sports.

With these considerations in mind, the present project was undertaken to expose family practice residents to sports medicine. The results were generally considered to be successful by all those concerned with the project. The athletic department was treated to a degree of interest and enthusiasm by the young residents beyond that

Table 3. Injuries and Illnesses			
	Football	Other Sports	Total
Injuries			
Strain:			
Quadriceps	1		1
Groin	1		1
Hamstring	2	1	3
Sprain:			
Shoulder	1		1
Acromioclavicular	1		1
Finger	1		1
Knee 1°	5	1	6
2°		2	2
3°	1		1
Ankle 1°	1	1	2
2°	1		1
Foot	1	2	3
Meniscus tear of knee	2	1	3
Neck Injury	4		4
Back Injury:			
Thoracic	1		1
Lumbrosacral	6		6
Contusion/Hematoma	10	1	11
Fracture:			
Metacarpal	1	1	2
Metatarsal	1	1	2
L-Spine transverse process	1		1
Ankle	1		1
Concussion	2		2
Stepped on Glass	1		1
Total	46	11	57
Illnesses and Other Conditions			
Infections:			
Viral Syndrome (see text)	13		13
Pharyngitis	3		3
Otitis externa	2		2
Pneumonia	1		1
Cellulitis	3		3
Tinea pedis	1		1
Tinea cruris	1		1
Warts	1		1
Mononucleosis	1		1
Abscessed tooth	1		1
Allergies			
Rhinitis	1		1
Adhesive tape sensitivity	1		1
Other:			
Inguinal hernia	1	2	3
Vasomotor rhinitis	1		1
Ganglion		1	1
Fatigue/exhaustion	2	1	3
Syncope	1		1
Headache	1		1
Total	35	4	39
Total Injury and Illness	81	15	96

Table 4. Summary of Evaluations, Injuries, and Illnesses*

	Foot- ball	Cross Country	Volley- ball		Basket- ball	Wrest- ling	Base- ball	Tennis		Track		Total
			F	M				F	M	F	M	
Preseason evaluations	64	9	12	0	15	19	22	5	7	8	11	172
Players on team	55	8	12	0	12	15	21	7	7	10	21	152
Injuries												
Players injured	29	0	0	—	1	3	2	0	0	1	3	39
Number injuries	46	0	0	—	1	4	2	0	0	1	3	57
Injury/Player	0.83	—	—	—	0.08	0.23	0.10	—	—	0.10	0.14	0.37
Illnesses												
Players ill	26	0	0	—	1	3	0	0	0	0	0	30
Number illnesses	35	0	0	—	1	3	0	0	0	0	0	39
Illnesses/Player	0.63	—	—	—	0.08	0.20	—	—	—	—	—	0.26
Total of players either injured or ill or both	41	0	0	—	1	6	2	0	0	1	3	54
Total diagnoses of injuries and illness	81	0	0	—	2	7	2	0	0	1	3	96
Total/Player	1.47	—	—	—	0.17	0.47	0.10	—	—	0.10	0.14	0.63

*Individuals participating in more than one sport were evaluated only once during the year, prior to the earliest sport in which they took part. Therefore, the number of players in sports occurring later in the year often exceeded the number of evaluations done for that sport. Several individuals initially evaluated either dropped out of the sport or were not selected for team membership by the coaches. The numbers of players at risk of injury in each sport includes only those remaining in the stable pool following these early eliminations.

which they had previously experienced. In addition, continuity of care was, in their opinion, substantially improved. The residents, although not particularly enthusiastic sports fans, enjoyed their interaction with the teams, trainers, and coaches.

More importantly, the educational benefits were substantial. The preseason assessments exposed the residents to a wealth of clinical situations in which decisions about risks of injury during athletic competition had to be made. Even though no player was disqualified, a wide spectrum of questions was posed by the positive findings of the initial histories and physical examinations. In addition, through their interactions with trainers and faculty, the residents were exposed to prophylactic measures which can be used to minimize morbidity in athletes. Of particular in-

terest was the fact that no cases of heat stroke or heat exhaustion were observed. This represented a successful application of preventive techniques discussed with the residents and employed vigorously by trainers and coaches in a desert setting where heat stress can be a significant problem. The difficulties of obtaining an accurate blood pressure determination in young individuals finding themselves in the unfamiliar and anxiety provoking surroundings of a physician's office were dramatically demonstrated. The presence of a number of undiagnosed and treatable medical conditions in a population generally assumed to be robust and healthy was also apparent (Table 2).

The illnesses seen are all relatively common and in no short supply in most family practices. The added educational value of these would not alone

compel one to engage in a project such as this. However, the injuries seen present quite a different picture. Particularly in the case of football players, a relatively high density of musculoskeletal injuries was observed. While this may not speak well of the game, it did offer an educational opportunity for experience with acute injuries, as well as the training, conditioning, and prophylactic measures intended to prevent them. The need for exposure to acute orthopedic injuries during residency training is not a goal easily met by many programs. The option of rotating on an orthopedic inpatient service usually requires the expenditure of a great deal of time and effort doing preoperative evaluations and assisting with surgical procedures which are only of marginal interest to a family practice resident. Involvement in a sports medicine program, particularly with a football team, may offer an educationally attractive alternative.

The central role of athletic endeavor in the development of many adolescent males, and now females, makes knowledge of the psychological aspects of sports almost mandatory for the family physician. In this project most of the athletes' families were not cared for in the FPC. Nevertheless, the resident was given the opportunity to observe personalities, motivations, function under stress, responses to success and failure, and general behavior of many young athletes.

Providing extra benefits for residents in training, such as trips to educational meetings, journal subscriptions, society dues, or special books, is often a difficult problem. Beyond their direct educational value, these benefits may serve as incentives, morale boosters, and rewards. The residents involved in this project have been able to attend special educational conferences and symposia because funds generated by this project were used to defray some of their costs. This would not have been possible otherwise.

The workload resulting from involvement in this project was significant only during the months of September, October, and November, the heart of the football season. As the Antelope Valley program is a new one, there was adequate physician time available during these months to provide the necessary services. However, in the future, provision should be made for setting aside resident time during these peak months in order to make the patient load manageable.

Conclusion

The experience of a group of family practice residents serving as team physicians for a small community college has been described. A variety of educational questions were posed by the preseason assessments performed on athletes. Residents were in this manner able to experience the decision making process involved in certifying individuals for athletic competition.

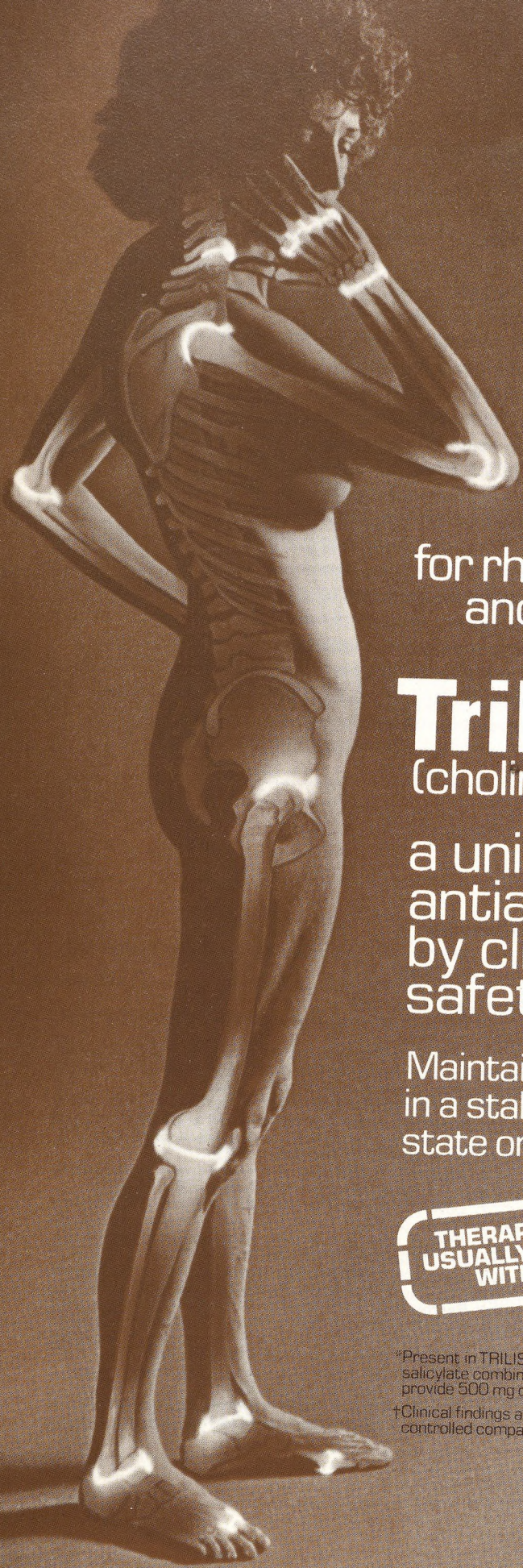
Many acute medical problems, particularly musculoskeletal injuries, were encountered during the year. It was possible for residents to follow injuries from the moment of trauma through rehabilitation and recovery in greater numbers than might be expected in other settings.

Some exposure to preventive and psychological aspects of sports medicine was also provided. Comprehensive care of athletes by involvement of the physician in the formulation of health policies for a community's athletic programs was stressed.

Serving as a team physician offers a valuable opportunity for residents to learn skills they can be expected to need in their future practices.

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