

# Use of a Sports Medicine Clinic in a Family Practice Residency

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The experience of a pilot sports medicine clinic in affiliation with a family practice residency program is reviewed. The use of volunteer orthopedic staffing along with residents working in an acute sports medicine clinic in a community hospital proved to be a valuable addition to the orthopedic exposure during residency training. Seventy-eight patient contacts involving 93 injuries were encountered over a seven-week period. Three injuries required hospitalization for further definitive care. The benefits derived suggest that a similar clinic setup in other residency training programs could enhance the required orthopedic rotation as well as give acute, responsible care to the injured athlete. Educationally the resident's role as the athlete's physician provided a clinical experience valuable to a primary care practice.

Sports-related injuries are becoming increasingly common in family practice. Participation in exercise and sports has more than doubled in the past 20 years. It has been estimated that over 50 percent of the US population now engages in some form of regular exercise, with women making up one third of this group.<sup>1</sup> Nearly 30 million young people aged 6 to 21 years are involved in regular out-of-school athletics, and it appears that school participation in sports is also on the rise.<sup>2</sup> During the 1980-81 academic year, more than 1.8 million women and 3.5 million men participated in interscholastic sports. Football was the most popular male sport with 958,000 participants, and basketball was the most popular female sport with over 420,000 participants.

The Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS) estimated that for athletes aged 5 to 14

years, the highest incidence of injuries occurred in football, with 453.9 injuries per 100,000 participants. These statistics include only those athletes who sought treatment in hospital emergency rooms.<sup>2</sup> Not surprisingly, the prevalence of injuries seems to be increasing, in part because of the greater number of individuals participating in sports.<sup>3</sup> These increases hold important implications for the family physician and suggest the need to learn to diagnose accurately and treat the more common sports-related injuries. Such experience can be obtained during the residency training program by utilizing a sports medicine clinic.

## Methods

Saginaw, Michigan, is a community of approximately 88,000 people; in its environs are 12 high schools, all offering multiple sports programs. A review of the emergency room records of one of the three community hospitals (St. Luke's) revealed 802 acute injury presentations for the group aged 13 to 18 years during all of 1982. Because of this number of injuries, as well as the residents'

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yearly participation in preathletic high school physical examinations for over 1,000 students, it was felt that a pilot sports medicine clinic could be initiated as part of each family practice resident's experience in orthopedics. Since residents were already serving as on-site team physicians for eight high schools, such an acute clinic would further facilitate the care and evaluation of the acutely injured athlete.

The sports medicine clinic was located in the emergency room of one of the local hospitals with a separate room set aside for the use of the clinic. All laboratory, x-ray facilities, and nursing personnel were supplied by the hospital emergency department.

Because epidemiologic literature revealed that most high school sports injuries occurred during football,<sup>2</sup> it was felt that the clinic should run from September through October, the duration of the area football season.

Prior to starting the clinic, the participating residents attended a didactic presentation given by the orthopedic staff member who had agreed to provide teaching for the residents. Educational goals and objectives were outlined. Information in the form of a printed handout dealing with the more common sports injuries and their treatment was given to those residents who would be covering high school football games.

The clinic was staffed by first- and second-year family practice residents. Supervision and teaching was voluntarily provided by a local orthopedic surgeon who had extensive experience in diagnosing and treating sports injuries. Two residents and the attending orthopedic surgeon staffed the clinic during each night of its operation. The clinic operated from 7 to 9 PM on Thursday nights, and from 8 to 11 PM on Friday nights. These hours coincided with the majority of the area varsity and junior varsity football games.

A telephone line in the emergency room was kept open so that a resident covering a football game could call and discuss on-site injuries or immediate treatment with the attending orthopedic surgeon.

An injured athlete arriving at the clinic was seen first by one of the residents, who would make the initial assessment and presumptive diagnosis. The case was then presented to the staff orthopedic surgeon, who would examine the athlete and discuss the injury and its treatment with the resident

as well as the patient and his or her parents. Appropriate care in light of the injury was then rendered. Each athlete treated received a printed instruction sheet describing the acute care relating to the specific injury.

The clinic was set up to care only for acute injuries, those injuries that had occurred within the previous 24 hours. All follow-up care was to be provided by the patient's own private family physician. This concept met with the general approval of the community family physicians.

## Results

The sports medicine clinic ran from September 9, 1982, through October 29, 1982. During this time, a total of 93 injuries were seen during 78 patient visits. Fourteen of these patients sustained multiple injuries.

As expected, football injuries accounted for the vast majority (81 percent) of injuries seen in the clinic. Sprains and strains were the most frequently seen type of injury, making up 39 percent of all presentations. Contusions were the next most common injury at 27 percent, and fractures were third, accounting for 16 percent of all injuries (Table 1). Forty-seven percent of all fractures were to the hand and ankle (27 percent and 20 percent, respectively). Forty-eight injuries (52 percent) occurred to the lower extremity, the body area most frequently injured. Twenty-four injuries (26 percent) were to the upper extremity, while the trunk sustained 11 injuries (12 percent) in this study (Table 2).

The knee was injured 52 percent of the time when injuries occurred to the lower extremity. While the majority of the knee injuries were of the sprain-strain type, 32 percent represented more severe subluxation or dislocation and meniscal injuries. Four (80 percent) of the subluxations or dislocations occurred at the knee.

When the upper extremity was injured, the hand was involved 46 percent of the time. The majority of these injuries were of the sprain or contusion type.

During the clinic three athletes presented with injuries severe enough to warrant hospitalization. In the first case, a 15-year-old freshman quarterback sustained a clipping injury that resulted in rupture of the anterior capsule, the medial collateral ligament, and a partial tear of the anterior

Table 1. Classification of Injuries

Type	No. (%)
Sprain or strain	36 (39)
Contusions	25 (27)
Fractures	15 (16)
Meniscus	4 (4)
Other	13 (14)
Total	93 (100)

cruciate ligament of his left knee. The second case involved a pass receiver who "felt something give" while running for a pass. He continued to play, but on the next play, he felt his leg snap as he was accelerating off the line of scrimmage. He sustained an avulsion fracture of the anterior superior and inferior iliac spines with disruption of the sartorius and rectus femoris muscles. The last case involved a football player who was caught at the bottom of a pileup after the ball carrier had been tackled. He sustained a comminuted fracture of the femur. The most surprising injury was sustained by a quarterback who suffered a humeral fracture through a unicameral bone cyst while throwing a football.

## Discussion

In classifying sports injuries, sprains and strains were the most commonly seen injuries, making up 39 percent of the total injuries seen at this clinic. The preponderance of these injuries is similar to that reported in previous literature.<sup>4,5</sup> For this study, sprains were defined as ligamentous injuries resulting from overstress causing some degree of damage to the ligament fibers or their attachment.<sup>6</sup> Strains were defined as injuries occurring to the muscle-tendon unit as a result of overstress or overuse.<sup>7</sup>

Contusions were next in frequency at 27 percent of the total injuries, and fractures were third with 16 percent of the injuries. Previous studies have shown various frequencies for injuries due to fractures, ranging from 10.6 percent to 24.1 percent.<sup>4,5,8,9</sup>

The lower extremity was injured two times as often as the upper extremity, a rate of injury in accordance with data reported by DeHaven and others.<sup>4,5</sup> The majority of the lower extremity

Table 2. Distribution of Injuries

Body Area	No. (%)
Lower extremity	48 (52)
Thigh	3 (3)
Knee	25 (27)
Lower leg	3 (3)
Ankle	12 (13)
Foot	5 (6)
Upper extremity	24 (26)
Shoulder	3 (3)
Arm	2 (2)
Elbow	6 (7)
Forearm	0 (0)
Wrist	2 (2)
Hand	11 (12)
Head and neck	10 (11)
Head	1 (1)
Eye(s)	2 (2)
Mouth	0 (0)
Face	1 (1)
Nose	1 (1)
Neck	5 (6)
Trunk	11 (12)
Hip or pelvis	1 (1)
Chest or ribs	4 (4)
Back	6 (7)
Total	93 (100)

injuries occurred at the knee in this study population, which is not surprising, since the knee is the most commonly injured joint in the body.<sup>5,8,10</sup>

The knee and ankle were the two most common sites of injury in the clinic, a finding consistent with all previous reports on high school football injuries.<sup>5,11-13</sup> The clinic also revealed a relatively high incidence of back injuries as a result of football. The rate was 7 percent, which is higher than the incidence cited in Blyth and Mueller's study.<sup>5</sup>

Sports medicine has become, in many cases, an extension of the family physician's own private practice.<sup>14</sup> Musculoskeletal injuries are among the top 20 diagnoses that present to the physician's office.<sup>15</sup> The experience gained in this pilot sports medicine clinic regarding the diagnosis and treatment of these acute injuries was beneficial.

In many family practice residency programs, the resident's own experience in orthopedics is usually limited to a combination of office and surgical (inpatient) exposure. Although a valuable

element of training, this is not the only method of teaching orthopedics. The sports medicine clinic was able to provide supplemental training to the residents in caring for common injuries. As can be seen in this sample, 66 percent of the injuries involved sprains, strains, or contusions. These injuries are readily treated by family physicians.

Because it was designed to be an acute care clinic, the ability to provide fast and competent medical care to the athlete was enhanced, avoiding much of the delay in presentation for medical care that otherwise might have occurred. Many athletes seeking immediate postinjury care would have had to either rely on the emergency room or wait until office hours the next day before obtaining medical care. It is well known that acute care for sports injuries is beneficial,<sup>16</sup> since prompt care lessens recovery time and allows serious injuries to be diagnosed before they become chronic problems.

The clinic was also able to provide more than injury care. Frequently, advice was given on rehabilitation of the injury and on conditioning and strengthening exercises to prevent further injury.

Of interest was the observation that the more serious football injuries appeared to occur in the junior varsity player. This observation is in accord with data reported from the Spokane study,<sup>8</sup> and may reflect the fact that the younger athlete has less muscle development, is usually less experienced, and may be in less adequate physical condition than older teenaged athletes. Recent data have shown a difference in the cardiovascular response to aerobic training among younger athletes when compared with their older counterparts.<sup>17</sup> This finding may necessitate modifications in preseason conditioning and training programs for these younger athletes.

Incorporated into the pilot sports medicine clinic was the experience of serving as the on-site team physician. It enabled quick assessment of injuries and often allowed the physician to witness the mechanism of injury. Frequent re-evaluation of the injury throughout the course of the game was also possible. In several instances, injuries thought at first to be minor later proved after re-evaluation and telephone consultation with the orthopedic surgeon at the clinic to warrant follow-up by x-ray examination or further evaluation by the staffing physician. In this way the resident benefited from additional, immediate second

opinions while giving the athlete the indicated care.

It should be stressed that this clinic encouraged private physician follow-up care. The sports medicine clinic provided acute care only, and it did not conflict with private physicians' regular office hours. It was considered important not to encroach upon the private physician-patient relationship, which is an integral part of family practice. By using the acute clinic model, this potential problem was avoided.

Noneducational benefits were also present in the establishment of the sports medicine clinic. It allowed busy emergency room physicians to see true emergency problems and provided a valuable community service in taking care of the acutely injured athlete.

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