INTRODUCTION:
Athletic motions such as throwing, serving, and spiking require a tremendous amount of shoulder mobility and stability to participate at a competitive and pathology-free level. Despite the advances in diagnostic and treatment interventions, shoulder pathology continues to plague overhead athletes and the clinicians that treat such pathologies. Although there has been an extensive amount of research investigating the kinematics, kinetics, and pathomechanics of the overhead athletic motions, little data are available detailing the shoulder injury rates among such athletes. Therefore, the purpose of this study was to determine the prevalence of shoulder injuries among NCAA Division I overhead athletes and to determine the types of shoulder pathology most common among specific overhead sports, such as swimming, baseball, softball, tennis, and volleyball.

METHODS:
Written informed consent was obtained from each subject prior to preseason medical examinations and in accordance with the University’s Institutional Review Board. Potential subjects were screened from the baseball, softball, swimming, tennis, and volleyball teams of a NCAA Division I institution. Data were collected from the preseason medical examinations and from the medical records maintained throughout the collegiate careers of 307 male and female (male = 130, female = 177) overhead athletes during the 2000-2006 competitive seasons. Inclusion criteria consisted of athletes who participated in any of the aforementioned sports at the NCAA Division I level. Exclusion criteria consisted of any injury that was not documented by an allied health care professional or those injuries determined to have been caused by a non sport-related event.

Medical records consisted of team physician examinations, diagnostic tests, and athletic trainer and physical therapist examinations and records. Information collected consisted of sport participating in at time of injury, diagnosis of injury, and method(s) of diagnosis (radiograph, MRI, CT, special tests, flexibility tests, strength tests) to assist in confirmation of the diagnoses. Specific surgical procedures, rehabilitation protocols, and time lost from competition were not collected for this investigation.

An injury was defined as physical trauma to an athlete’s shoulder in which medical treatment was sought by an allied health care professional. The investigators felt this definition would encompass not only the traumatic injuries that may have required time lost from competition, but also the chronic injuries that may have been treated on a day-to-day basis without missing any practices or games. Shoulder injuries were categorized into one of the following groups: periscapular strain, impingement syndrome, SLAP lesion, rotator cuff tendonitis, biceps tendonitis, anterior instability, multi-directional instability, clavicular fracture, acromioclavicular sprain, and pectoralis major strain.

RESULTS:
A total of 110 baseball players, 47 softball, 83 swimmers, 40 tennis, and 27 volleyball players were investigated for a total of 307 overhead athletes.

Shoulder injuries were documented in 30% of the intercollegiate athletes. Due to the repetitive nature of various overhead athletic activities, factors such as soft tissue contraction,[1] muscle weakness and altered neuromuscular coordination,[2] as well as bony and postural abnormalities[3] have been associated with shoulder pathology. This study found rotator cuff tendonitis and subacromial impingement to be the most common shoulder pathologies recorded among the intercollegiate baseball, softball, swimming, tennis, and volleyball athletes. Volleyball players had the highest occurrence of shoulder pathology among the overhead athletes. Furthermore, athletes with a history of shoulder pathology were inclined to subsequent shoulder injury.

For motions such as the tennis serve, throwing, and the volleyball spike, the high rotational forces placed on the shoulder during the acceleration and deceleration phase of the movements places the soft tissue structures at risk for micro-trauma and an ensuing pathology. Although, the swimming motion doesn’t produce such drastic acceleration and deceleration forces, the repetitive overhead motions and subsequent periscapular and rotator cuff fatigue place the shoulder in a similarly vulnerable position to that of the more dynamic athletic movements. As athletes transition from seasonal high school sports to the year round training and competitions of collegiate athletics, these athletes are at an increased risk for the development of shoulder pathology.[4]

The results of this study emphasize the need for prevention techniques to decrease the prevalence of shoulder injuries among overhead athletes with particular measures targeting prevention of subacromial impingement and rotator cuff tendonitis. Early detection of such pathologies may lead to decreased periods of time lost from competition, costly medical bills, and the possible need for surgical intervention.

REFERENCES:

ACKNOWLEDGMENTS:
We would like to acknowledge the efforts and assistance of the athletic training staff at Illinois State University.