and shorter rehabilitation times could have a great impact, and proper stretching might be the key. The authors of this study have objectively analyzed how the ankle responds to different types of stretching.

Twenty-four men and women (mean age 26 years) who were currently involved in recreational and/or competitive sports for at least 1 to 2 hours, 3 to 4 times per week participated in the study. All subjects were reported to be healthy, and none were engaged in ''formal'' stretching programs. Four groups were formed in order to test 4 types of stretching programs. The 4 programs were a continuous hold for 60 seconds, 2 sequential holds for 30 seconds each, 4 sequential holds for 15 seconds each, and continuous passive motion for 60 seconds. Specially designed equipment moved the subjects' ankles through 1 of the 4 programs. A ''hold'' was defined as dorsiflexion at 80% of each person's maximum range of motion. Each person had 60 seconds of stretching per day for 1 week in each of the 4 groups.

Sensors within the equipment measured stiffness and force relaxation. ''Stiffness'' was defined as resistance to movement, while ''force relaxation'' referred to the tension of the muscles of dorsiflexion at any given position. According to the results, only continuous passive motion significantly reduced stiffness ($P < .05$), as measured over the first 10% and last 10% of motion. Muscle tension was found to be most reduced by holds. Continuous motion reduced tension by an average of 10.5%, whereas holds decreased tension by 19% to 21.7%, with the greatest decreases in the first 20 seconds of a hold or series of holds.

The authors of this study propose that these results have ramifications for both injury prevention and rehabilitation. They conclude that one should perform holds to decrease peak forces, and that one should perform continuous motion to decrease stiffness. As with all bench research, however, there are several caveats in applying study results to real life. First, the internal validity of the study itself must be solid. In this study, it must be noted that stiffness was reported only at the 30-second point of each program, and not at all during the 60-second hold. Consequently, one must ask if significant differences in stiffness might have been seen after all four 15-second holds, after both 30-second holds, or at the end of the 60-second hold. Secondly, laboratory conditions must simulate real life. This study assessed how the ankles and legs of healthy athletes respond to stretching. It cannot be inferred that this applies to people in all degrees of physical condition. Nor can one postulate that the viscoelastic properties of injured ankles are the same as those in this study, thus giving this study little applicability for rehabilitation. It seems that the most valuable finding that this study provides is that both holds and continuous motion change the biomechanics of the ankle in healthy athletes. The ramifications of these findings have yet to be determined.

(*Med Sci Sports Exerc.* 2001;33:354–357) P. J. McNair, E. W. Dombroski, D. J. Hewson, and S. N. Stanley.

NEW ENGLAND JOURNAL OF MEDICINE

La Crosse encephalitis in children

Most cases of La Crosse (LAC) encephalitis are undiagnosed. Not only have confirmatory tests been insensitive and expensive, but there have been no specific treatments proven to affect outcome. Furthermore, most patients with this mosquito-borne virus suffer little more than cold symptoms. At the same time, however, not everyone with LAC encephalitis has a benign outcome. Also, some treatments are being developed. This recent article, published in the *New England Journal of Medicine,* provides an updated description of LAC encephalitis and attempts to identify risk factors for developing severe disease. It also discusses some of the potential treatments available.

The authors of this study performed a retrospective chart review of 127 children who were diagnosed with LAC encephalitis in Charleston, WV, between 1987 and 1996. Multiple statistical calculations were performed, including univariate analyses. They provide both epidemiological data and clinical data on all 127 children.

The mean age of patients in this study ($\pm$ SD) was 7.8 $\pm$ 3.5 years, and most cases were diagnosed between July and September. The most common symptoms on presentation were headache, fever, vomiting, mental status changes, and seizures. Although patients who suffered clinical deterioration more often had fevers, vomiting, and seizures, the sensitivity and specificity of these symptoms were too low to be of clinical value. Patients with in-hospital deterioration did, however, have statistically significant lower sodium levels and higher fevers than those with benign outcomes. They also tended to have Glasgow Coma Scores less than 13. Laboratory and radiographic findings were nonspecific. Some patients were given ribavirin therapy, but the results of this therapy will be part of another clinical report.

Not all children recover from LAC encephalitis free of long-term sequelae. In this study, 15 children (12%) had neurological deficits at discharge. Of the children aged 5 years and older, 28 (32%) were classified as having relatively severe disease. Cognitive testing of these children 10 to 18 months after hospitalization revealed consistently lower IQ scores than average. No proven treatment is available for LAC encephalitis, but new drugs are being tested. Also, antibody screens can more accurately diagnose LAC encephalitis than in the past. Currently, most children are misdiagnosed and are given unnecessary, ineffective antibiotics. Correctly diagnosing LAC encephalitis and recognizing potential markers of clinical deterioration should enable physicians to better treat these children and reduce morbidity.

(*N Engl J Med.* 2001;344:801–807) J. E. McJunkin, E. C. De Los Reyes, J. E. Irazuzta, et al.

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