Sample Research Abstracts

Conference Abstract
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Comparing the Effects of Static and Dynamic Stretching Routines on Shoulder Range of Motion and Performance

Historically, it has been thought that stretching prior to exercise reduces or helps prevent injuries. Most active individuals were taught to stretch statically before and after exercise. Recent research indicates that athletes who use a dynamic warm up before their events outperform athletes who use a static stretch. However, the existing literature is inconclusive and very little research has been conducted on the upper extremity. The purpose of this study was to determine if there is a significant difference in using a dynamic or static warm up to increase shoulder range of motion and performance. This study included 14 healthy individuals (21.2 + 2.6 years) who partook in a dynamic stretching, static stretching, or control session over a three week period. Prior to, and upon completion of every session, each subject performed range of motion testing and a closed kinetic chain upper extremity test (CKCUE test). Our results thus far indicate that external rotation of the shoulder and the performance test both had improvements in both dynamic and static stretching routines. We anticipate that this research will be of great value to clinicians in a variety of rehabilitation settings by helping them make an informed decision in determining the appropriate mode of warm up for their patients. (207 words)

Journal abstract
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The hydrodynamics of dolphin drafting

Drafting in cetaceans is defined as the transfer of forces between individuals without actual physical contact between them. This behavior has long been surmised to explain how young dolphin calves keep up with their rapidly moving mothers. It has recently been observed that a significant number of calves become permanently separated from their mothers during chases by tuna vessels. A study of the hydrodynamics of drafting, initiated in the hope of understanding the mechanisms causing the separation of mothers and calves during fishing-related activities, is reported here. Quantitative results are shown for the forces and moments around a pair of unequally sized dolphin-like slender bodies. These include two major effects. First, the so-called Bernoulli suction, which stems from the fact that the local pressure drops in areas of high speed, results in an attractive force between mother and calf. Second is the displacement effect, in which the motion of the mother causes the water in front to move forwards and radially outwards, and water behind the body to move forwards to replace the animal's mass. Thus, the calf can gain a 'free ride' in the forward-moving areas. Utilizing these effects, the neonate can gain up to 90% of the thrust needed to move alongside the mother at speeds of up to 2.4 m/s. A comparison with observations of eastern spinner dolphins (Stenella longirostris) is presented, showing savings of up to 60% in the thrust that calves require if they are to keep up with their mothers. A theoretical analysis, backed by observations of free-swimming dolphin schools, indicates that hydrodynamic interactions with mothers play an important role in enabling dolphin calves to keep up with rapidly moving adult school members. (279 words)