



How to hike hard

Precis of Australian Sailing article by Ralph Skea

There is a definite limit to how long a dinghy sailor can hold an effective hiking position. Ever felt your legs start to burn before the end of the first beat? This is caused by static contractions of the large muscles of the thighs and trunk. Static contractions involve a muscle developing tension without making the joints move. Even at relatively low levels of static muscle tension, the blood vessels can be squeezed shut and the resultant lack of blood will rapidly cause pain and fatigue.



^ Despite being near the finish of a long and very windy race at the Nationals, Neal Schneider (the current National Champion) still demonstrates good hiking technique.

In order to study the factors which influence a sailor's endurance while hiking, researchers at the University of Canberra had subjects "sail" a 90 minute race in the laboratory. The simulator that they "sailed" was a specially set up Laser hull with all normal control systems under load. Subjects hiked from the simulator and performed their normal on-water movements (shifting arms and trunk to trim sails, drive the boat through waves and steer) in tandem with a video of a top Laser helmsman sailing an actual two triangle race in windy conditions. The subject's heart rate, blood pressure, energy consumption etc. were monitored during the "race" to determine their physiological responses.

A large increase in blood pressure was measured as well as a steady rate of energy consumption indicating that hiking is a moderate, sustained form of exercise. The use of aerobic energy during the three 20 minute upwind legs was 30 – 50% of the subject's maximum, however, blood pressure was extremely elevated. In fact, blood pressure levels matched those attained during maximum bicycle exercise, indicating how strongly the muscles contract to slow blood flow. Both blood pressure and aerobic demand were significantly lower during the reaching legs.

The factors found to determine hiking performance were the sailors weight in sailing clothing, standing height, thigh (quadriceps) muscle strength and endurance, and how far out the hiking strap is set. The last factor is related to the endurance of the relevant muscles involved in hiking (quadriceps, hip flexors, abdominal muscles) since setting the strap, and consequently the body, farther out requires greater muscular effort.

Thigh muscle tension while hiking was found to be 26% of the muscles strength. Other studies have found that static contractions of the thigh muscles at this level will result in fatigue within five minutes. Thus it is the discontinuous nature of hiking, with rest periods due to tacking or responding to waves and wind changes, that allows sailors to sustain static



contractions for extended periods. This explains why holding a completely static position on a hiking bench is a lot harder than sailing.

Hiking endurance can be improved if you momentarily relax or reduce muscle tension every so often to promote blood flow. If you tune in to the sensations or pain from the muscles you will be able to tell when you should relax them to stop becoming over fatigued.

Aerobic training can help condition the heart and blood vessels to withstand the high blood pressure involved in hiking and may improve endurance. Cycling is probably the best aerobic activity for sailors given that the thigh muscles are heavily involved. Rowing on a machine is useful upper body exercise for sheeting. If you set your hiking strap further out, physical training or other measures are required to reduce muscle tension. Improving knee extensor muscle strength by weight training exercises such as knee extensions, leg presses, squats etc. should eliminate the tendency to hang off the mainsheet.



^ Former National & International Champion, Glenn Ashby, showing his 'extreme' hiking style. Note how far down his leg the gunwale is and also how far out his footstraps are. You have to be fit to hike like this for the duration of a race!

The back of the thighs should be thickly padded to spread the pressure from the relatively sharp edge of the gunwale which compresses the blood vessels. Stiff battens approximately 20cm long sewn into hiking shorts or wetsuit down the length of the thigh helps to smooth out the ride dramatically, but make sure they are comfortable and don't move around. One layer of wetsuit over the back of the thighs is not enough and great gains can be made in hiking endurance by spreading the weight over the thighs.



^ Wayne Eager in action at the 2000 States at Wagga. The regular change from hiking out to sitting in (and vice versa), that is often necessary at inland venues, causes less fatigue than trying to hike for a full race.