

# Stay strong, focus on drills, do race-pace training and focus on good technique.

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## Introduction

It's a bummer getting older. While we still feel strong in the water, when we look up at the clock doing repeat 50's or 100's, the second hand appears broken because it's 1-2 second slower per year! Surely there are some things we can do to stop the inevitable slowdown in swim times. Here's some Italian research giving us some insights into reasons why we slow down with age and more importantly, what we can do about it.

## The Research

The aim of this study was to measure the energy cost (oxygen used at a specific speed) of freestyle swimming in 47 competitive male masters (31–85 years old) swimming freestyle at below-maximum aerobic speeds. Each swimmer swam for about 4 minutes at a constant speed and stroke rate. The sport scientists measured the oxygen consumption using a method called the backward extrapolation method where they measured oxygen use for 60 seconds after the swim finished using expensive machinery and then estimated how much oxygen the swimmers used during the swim. During the same swim, propelling efficiency (a measure of efficiency of the underwater pull phase) and projected frontal area (body surface area facing the water) were determined using video analysis and complicated mathematical equations.

## The Results

Older masters (60–80 years) swam at a significantly slower pace ( $0.65$  vs.  $0.91 \text{ m s}^{-1}$ ), with a lower propelling efficiency ( $0.23$  vs.  $0.31$ ) and a larger frontal surface area ( $0.39$  vs.  $0.23 \text{ m}^2$ ) than “younger” masters (30–60 years). No significant statistical differences in the energy costs of freestyle swimming ( $1.45 \text{ kilojoules. m}^{-1}$ ) were observed as a function of age or swim speed across the aging swimmers. However, the energy cost values were significantly higher than those assessed in young elite swimmers at the same speeds with the difference increasing with age at a rate of  $0.75\%$  per year, particularly after the age of 40 years. The results also showed that stroke frequency is maintained with age but that the distance per stroke drops with age, particularly after 60 years of age.

## The So What?

Previous studies have shown that world records in freestyle are maintained until about 35–40 years, followed by a modest decline until 50–60 years after which the decline in performance becomes more evident, particularly after 70 years. The research reported above strongly suggests masters swimmers need to be very focused on maintaining factors that can preserve the energy cost of swimming at a constant speed. These things are – strength training that is specific to the stroke(s) we are wanting to perform in; drills that preserve and develop technique through greater distance per stroke; race-pace swims (e.g. broken swims, repeats at race pace); and flexibility training to increase range of motion about joints. For more on the strength training, flexibility training, and the importance of efficiency in masters swimmers, the book [The Masters Athlete](#) discusses in detail what science says works. Train with great technique - every stroke, every repeat and every session!

Zamparo, P. and others (2012). The determinants of performance in masters swimmers: a cross-sectional study on the age-related changes in propelling efficiency, hydrodynamic position and energy cost of front crawl. *European Journal of Applied Physiology*, 112(12): 3949-3957.