

Non-Fatiguing General Conditioning Exercise Program (The 20% Rule)

Stanley K. Yarnell, M.D., Department of Physical Medicine and Rehabilitation; Jill Sweringen and Lizanne Pastore, Supervising Physical Therapists, Post-Polio Clinic, St. Mary's Hospital and Medical Center, San Francisco, California

Since 1981, 711 patients have been seen in the Bay Area Post-Polio Clinics. The most frequently complained of symptom was unaccustomed fatigue (79%). The causes of fatigue may be multifactorial, but it has been our observation that a significant number of polio survivors complaining of fatigue (close to one-third) can date the onset of their profound fatigue to the period after illness, surgery, or trauma, suggesting that deconditioning of the muscle fibers of the delicate old polio motor units is a significant contributing variable. Furthermore, we have noted that polio survivors generally take three to four times longer to convalesce from surgery, illness, or trauma than individuals who have a full complement of anterior horn cells. The non-fatiguing general conditioning exercise program using the 20% rule was designed to help restore stamina or endurance for those individuals who have continued to be bothered by profound fatigue following surgery, illness, or trauma.

The program begins by determining the polio survivor's maximum exercise capability with the help of the clinic physical therapist. The type of exercise can be in a pool or on dry land using an arm ergometer or an exercise bicycle, depending on the individual's abilities and preferences. If the individual prefers swimming, the maximum number of laps that the patient can swim is used as the maximum exercise capability. If the survivor has considerable residual weakness and is only able to swim one lap in half an hour, then the amount of time actively swimming can be used as the maximum exercise capability rather than the number of laps.

Having established the maximum exercise capability, the polio survivor is instructed to begin his aerobic swimming program at 20% of the determined maximum exercise capability. He can swim three to four times per week at that level for one month, and then he is instructed to increase by 10%. For example, if an individual is able to actively swim in a pool for half an hour, then one-half hour would be his maximum exercise capability. He would begin swimming just six minutes per session three to four times per week for a month before increasing the amount of time actively swimming to nine minutes three to four times per week for another month. Then he would increase by 10% once again so that he was actively swimming 12

minutes per session three to four times per week for another month, and so on. After three to four months our patients have reported that they feel an increase in their general stamina or endurance.

Alternatively, if an arm ergometer or exercise bicycle is used, the same basic principle can be utilized, calculating distance pedaled or time spent actively pedaling the ergometer or exercise bicycle. The individual begins his aerobic or non-fatiguing general conditioning exercise program at 20% of maximum exercise capability three to four times per week for one month before increasing the distance by 10%. He continues with that level of activity for another month before increasing by another 10% so that he is exercising at 40% of maximum exercise capability. For example, if an individual is able to pedal an exercise bicycle for one mile or is able to actively pedal the bicycle for up to 20 minutes, then that is his maximum exercise capability. He is instructed to begin his exercise program at one-fifth of a mile (or if time is used, then four minutes is the beginning exercise time). This is repeated three to four times per week for an entire month before increasing the distance pedaled to one-third of a mile or six minutes. Our patients are encouraged to stick with that for an additional month before increasing by another 10%, and so on.

Individuals are cautioned to stop if they become fatigued during their exercise program, or if they experience pain or achiness in their muscles. Most polio survivors are able to continue increasing their exercise program to nearly the maximum exercise capability, though it clearly would take a full nine months if this program were strictly followed. Conditioning or aerobic exercise at this submaximal level allows the individual to regain a healthier sense of stamina without damaging delicate old motor units.

Additionally, it is imperative to incorporate the concept of pacing and spacing within the non-fatiguing general conditioning exercise program. This means that rests are to be taken during the exercise program every few minutes.

The 20% rule is sometimes also applied to polio survivors when they are given instructions in a home flexibility and stretching program so they do not exercise too vigorously.

This exercise program can be modified somewhat with the supervision of a physical therapist, depending on the progress made by the polio survivor. This program may not eliminate fatigue for all polio survivors, but we have found it effective for those who have a significant element of deconditioning contributing to their sense of fatigue. It has also been quite useful for polio survivors to use as an exercise guideline following surgery, illness, myocardial infarction, or trauma.