Blood Pressure and Exercise Notes

http://www.ehow.com/facts_4895351_normal-blood-pressure-during-exercise.html

Dynamic Exercise

Rapid and continual movement of the limbs is called dynamic exercise. In the average person, it is not uncommon for blood pressure to increase from 120/80 in a resting period to 195/75 during exercise.

Physical Condition

A person in good shape will have less of an increase than someone who is overweight. A typical normal range of increase would be between 160 to 220/75.

Exertion Exercise

Heavy lifting constricts the muscles, decreasing the oxygen and causing an increase in both the systolic and diastolic numbers. There is no normal range in exertion exercises.

Exercise and Resting Blood Pressure

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http://www.unm.edu/~lkravitz/Article%20folder/restingbp.html

Aerobic Exercise Prescription for Lowering High Blood Pressure

The aerobic exercise prescription for lowering resting blood pressure includes moderately intense aerobic exercise at 40% to 60% of VO2max, for 30 to 45 minutes, on most days of the week. Aerobic exercise is a potent intervention in lowering and preventing the incidence of hypertension.

Those with high normal and Stage 1 hypertension (See Table 1) may expect a drop of up to 8 – 10 mmHg and 6 – 10 mmHg in systolic and diastolic blood pressure, respectively, due to the independent effect of aerobic exercise (Neiman 1998). It is interesting to note that most of the lowering of systolic and diastolic blood pressure in those with hypertension occurs within a few weeks of consistent aerobic training. The exact mechanism how aerobic exercise helps to lower high blood pressure is unclear, however it is theorized that biochemical, neural and hormonal changes in the blood vessel walls induce an acute and long-term blood vessel relaxation.

How effective is Resistance Exercise in Lowering Blood Pressure?

The research has been unclear as to the relationship of progressive resistance exercise and those individuals with hypertension. Studies

in this area have been criticized for having small sample populations and inadequate research designs.

However, Kelley and Kelley (2000) recently employed a powerful quantitative research technique known as meta-analysis, to better ascertain what is truly known about the use of resistance exercise as a nonpharmacological intervention in lowering resting blood pressure in adults. Using this sophisticated statistical design, these researchers concluded that *participation in resistance exercise results in decreases of approximately 2% and 4% in systolic and diastolic blood pressure, respectively*. The length of training in all the studies was from 6 to 30 weeks, with a mean training period of 14 weeks. Frequency ranged from 2 to 5 times per week, with an average of 3 times per week. The intensity ranged from 30% to 90% 1-RM, with a mean of 35% 1-RM. The duration per session varied from 20 to 60 minutes, with a mean session length of 38 minutes. The number of sets per exercise ranged from 1 to 4, with an average being 2 sets. The number of exercises ranged from 6 to 14 with the mean being 10 exercises. Means for the actual number of repetitions and rest between sets were not reported in all investigations, so this information can only be reported in ranges. The number of repetitions ranged from 5 to 50 repetitions, and the rest between sets ranged from 15 to 120 seconds.

The meta-analysis suggests that progressive resistance exercise has modest reductions in resting systolic and diastolic blood pressure. It is important to note that even small reductions in blood pressure have a beneficial effect in reducing cardiovascular disease morbidity and mortality (Kelley and Kelley 2000).

An interesting finding of this investigation was that circuit training protocols result in similar blood pressure changes as do traditional % 1-RM designs. The researchers suggest uttermost caution in prescribing high intensity resistance exercise for those with high blood pressure, as peak systolic and diastolic values of 320 and 250 mmHG have been observed with this type of training.

Blood Pressure Response to Aerobic Exercise

During upright exercise, the normal blood pressure response is to observe a progressive increase in systolic blood pressure with no change or even a slight decrease in diastolic blood pressure.

The slight decrease in diastolic blood pressure is due primarily to the vasodilation of the arteries from the exercise bout. Thus, the expansion in artery size may lower blood pressure during the diastolic phase. A failure of the systolic blood pressure to rise with an increase in intensity (called exertional hypotension) is considered abnormal, and may occur in patients with a number of cardiovascular problems. Contrariwise, an increase in diastolic blood pressure of more than 10 mmHg during or after exercise represents an unstable form of hypertension, and may be associated with coronary artery disease.

Following exercise, systolic blood pressure progressively declines during an active recovery. With a passive (such as seated) recovery, systolic blood pressure may drop abruptly due to the pooling of blood in the peripheral areas of the body. There may also be a drop in diastolic blood pressure, during the recovery phase of exercise due to the vasodilation. Persons on

medications will have variable responses to exercise. Therefore it is prudent to contact their health practitioners to be aware of what would be considered normative under these circumstances.

Table 1. *Classification of Blood Pressure for Adults Aged 18 Years and Older**

Category	Systolic BP (mm Hg)		Diastolic BP (mm Hg)
Optimal	< 120	and	< 80
Normal	120–129	and	80–84
High Normal	130–139	or	85–89
Hypertension			
Stage 1	140–159	or	90–99
Stage 2	160–179	or	100–109
Stage 3	>= 180	or	>= 110

From the *Sixth Report of the Joint Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNCVI),* Public Health Service, National Institutes of Health, National Heart, Lung and Blood Institute, NIH Publication No. 98-4080, November 1997.

*Based on the average of two or more readings taken at each of two or more times. When diastolic and systolic blood pressure falls into different categories, the higher category should be selected for classification.