

Exercise and Hypertension



Blood pressure classification for adults aged ≥ 18

BP category	SBP (mmHg)	DBP (mmHg)
Optimal	< 120 and	< 80
Normal	$120 - 129$ and	$80 - 84$
High normal	$130 - 139$ or	$85 - 89$
Stage 1 hypertension	$140 - 159$ or	$90 - 95$
Stage 2 hypertension	$160 - 179$ or	$100 - 109$
Stage 3 hypertension	≥ 180 or	≥ 110

Risk stratification and treatment

Blood pressure stages (mmHg)	Group A(No RF, No TOD/CCD)	Group B(at least 1 RF, No DM, No TOD/CCD)	Group C (DM, TOD and/or CCD,± RF)
High normal (130-139/85-89)	Life style modification	Life style modification	Drug therapy
Stage 1 (140-159/90-99)	Life style modification (up to 12 months)	Life style modification (up to 6 months)	Drug therapy
Stage 2&3 (≥160/≥100)	Drug therapy	Drug therapy	Drug therapy

Lifestyle interventions

- Keep low dietary sodium intake
- ↓ excessive consumption of alcohol, coffee
other caffeine-rich products
- Stop smoking
- Regular exercise



Exercise and blood pressure benefits



- **Dynamic aerobic training reduces resting BP in individuals with normal BP and in those with HT (acute and chronic effects)**
- **↓ ambulatory BP, and BP at fixed submaximal work load**
- **Decrease in BP appears in HT > normal BP subjects, in HT subjects ↓ BP ≈ 5-7 mmHg**
- **Acute endurance effect (post exercise hypotension) persist for up to 22 hr**

Resistance exercise

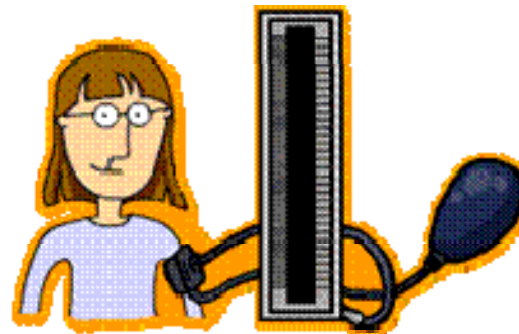


- Chronic **concentric and eccentric** effect
- “ resistance training performed according to ACSM guidelines reduces BP in normotensive and hypertensive adults ”**

Exercise → primary prevention, treatment and control HT

Potential mechanism for reduction BP after exercise

- Neurohormonal, vascular, structural adaptation
- ↓ TPR, ↓ catecholamines, improve insulin sensitivity



Exercise recommendation

Evaluation

- History taking
- Physical examination
- Screening test



- Major risk factors
- Target organ damage
- CVD complications

Need exercise test

- Engage in hard or very hard exercise
- Stage 3 HT (Group C), no CVD : moderate intensity (40%-60% VO_2R)



No need for exercise test

- Stage 1 or 2, Group A or B : light to moderate exercise (< 60% VO_2R)
- Stage 3 (Group C) : light or very light intensity (< 40% VO_2R)



Exercise prescription



- **Type** : primarily **aerobic** activity supplemented by resistance exercise
- **Intensity** : **moderate** intensity (40%-60% VO_2R)
- **Duration** : 30 minutes or more continuous or intermittent exercise per day (minimum of 10 minutes intermittent bouts), **total 30-60 minutes**
- **Frequency** : on most, preferable all, days of the week

Safety and special considerations



- Strenuous physical activity (abrupt \uparrow HR & BP) can trigger acute MI : latent or known case of heart disease, **sedentary**
 - **Medication :**
 - β blocker : abnormal HR response \rightarrow use RPE
 - Diuretics : abnormal regulation of temperature \rightarrow dehydration, heat illness
 - Antihypertensive medication + PEH : hypotension \rightarrow extend cool down
 - Normal BP response : 8-12 mmHg / 1 METs, during exercise keep **BP \leq 220/105 mmHg**
 - HT with exercise test : intensity training set safety below ischemic ECG, angina threshold \geq **10 bpm**
- } hypoglycemia