Exercise for Hypertension: New Recommendation Strategies for Blood Pressure Control

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ABSTRACT

Hypertension is a leading preventable risk factor for cardiovascular disease, stroke, and premature death worldwide. Due to its undeniable antihypertensive effects, exercise training is advised as an effective nonpharmacological method of preventing, treating, and controlling hypertension by the main professional and scientific societies, including the American College of Cardiology, American Heart Association, European Society of Hypertension, American College of Sports Medicine, and Exercise and Sport Science Australia. In this review, we aim to summarize the current recommendations of exercise training for hypertension and discuss the emerging research supporting the integration of new exercise strategies, such as neuromotor and isometric resistance exercise, for the prevention and management of hypertension.

Keywords: high blood pressure, antihypertensive, exercise training

INTRODUCTION

Hypertension continues to be the most predominant cardiovascular disorder in the world. The prevalence of hypertension among people aged 30–79 years doubled over the past 3 decades, affecting 1.28 billion adults worldwide (1). In addition, high systolic blood pressure (SBP) remains the primary modifiable risk factor for attributable premature cardiovascular mortality, having caused 10.8 million cardiovascular disease deaths and 11.3 million total deaths in 2021 (2). Moreover, although the elevation of SBP has greater impact on cardiovascular outcomes, both systolic and diastolic hypertension are independent predictors of cardiovascular events in the general adult population (3).

Engaging in regular physical activity or exercise offers numerous health benefits, including improving cardiovascular health and reducing the risk of chronic diseases such as hypertension (4). Authors of studies have reported an inverse dose-response relationship between physical activity and the development of hypertension in adults with normal blood pressure (BP) and a reduced risk of cardiovascular disease progression in adults with hypertension (5). Aerobic and dynamic resistance exercise, alone or combined, are recommended by all major guidelines for the prevention and management of hypertension (6–8). Recently, isometric resistance exercise training (IRT) has also been recommended for prevention of hypertension (8). Additionally, impressive BP reductions are reported for alternative exercise programs such as yoga (9) and tai ji quan (10). However, the limited number of studies of isometric and alternative exercise compared with the aerobic and resistance exercise literature may be preventing their inclusion as recommended first-line interventions for the prevention and treatment of hypertension.

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In this narrative review, we address these research gaps with new and emerging exercise recommendations for the prevention and treatment of hypertension, with a focus on isometric exercise training and alternative types of exercise, such as yoga. Additionally, we will explore the current body of evidence pertaining to individuals with resistant hypertension (RH).

CURRENT EXERCISE RECOMMENDATIONS

Exercise is recommended as cornerstone first-line lifestyle therapy for adults with hypertension (11–13). A recent metareview by the Physical Activity Guidelines for Americans Advisory Committee (14) published as an American College of Sports Medicine (ACSM) pronouncement (5) stated with moderate strength evidence that the magnitude of the BP lowering effects of exercise is similar for aerobic and dynamic resistance performed alone or combined among adults with hypertension. In addition, complementary or alternative neuromotor types of exercise such as yoga, pilates, and tai chi were promising for their antihypertensive benefits, but caution was urged in recommending neuromotor exercise. Within the ACSM pronouncement, no comment was made on the antihypertensive effects of isometric resistance training because the literature on this topic was very limited at that time (5,14).

An exercise prescription is an individualized physical activity program framed by the frequency (how often?), intensity (how hard?), time (how long?), and type (what kind?) or the FITT principle (15). Based upon the recent evidence provided by the Physical Activity Guidelines for Americans Advisory Committee (14) and ACSM pronouncement (5), the ACSM updated the FITT exercise prescription for hypertension, as shown in Table 1 (16). The current ACSM FITT exercise prescription for hypertension consists of performing aerobic or dynamic resistance exercise alone or combined (termed *concurrent exercise*) on most, preferably all, days of the week for at least 20–30 minutes per day to total at least 90–150 minutes per week of continuous or accumulated exercise of any duration. The exercise intensity can be low, moderate, or vigorous, although moderate intensity should be emphasized. Neuromotor and flexibility exercise can be added to improve balance and range of motion, reduce the risk of musculoskeletal injury, and decrease the risk of falls as well as lower BP.

TABLE 1. The ACSM FITT exercise prescription for adults with hypertension (adapted from (5,16)).

FITT	Summary
Frequency	On most, preferably all, days of the week
Intensity	Low, moderate, or vigorous; emphasize moderate
Time	≥20 to 30 min/d to total ≥90 to 150+ min/wk of continuous or accumulated exercise of any duration
Type	Emphasize aerobic[a] or resistance exercise[b] alone or combined in addition to neuromotor[c] and flexibility[d]

ACSM FITT = American College of Sports Medicine; frequency, intensity, time, and type
[a]Prolonged, rhythmic activities using large muscle groups (e.g., walking, cycling, swimming)
[b]Resistance machines, free weights, resistance bands, and/or functional body weight exercise
[c]Exercise involving motor skills and/or functional body weight and flexibility exercise such as yoga, pilates, and tai chi
[d]Static, dynamic, and/or proprioceptive neuromuscular facilitation

NEW EXERCISE STRATEGIES TO PREVENT AND TREAT HYPERTENSION

Isometric Exercise

Accumulating evidence suggests that IRT can be an efficacious strategy to prevent and treat hypertension. IRT encompasses static muscular contraction, which is characterized by a sustained contraction against an immobile resistance, with limited or no alteration in the length of the contracting muscle (17). Authors of most studies investigating the effects of isometric exercise on BP in patients with hypertension have used handgrip IRT (18), while fewer have evaluated the impact of leg IRT (e.g., static wall squat) (19). Handgrip IRT typically involves 4 sets of 2 minutes of unilateral or bilateral sustained muscle contractions against a dynamometer at 10%–30% maximal voluntary contractions (MVCs) with 1–3 minutes of rest between contractions and a total volume of 12–40 minutes per session (18,20). However, a few acute (21) and chronic handgrip IRT studies (22,23) have used higher intensities (usually shorter protocols ranging from 50% and 60% MVCs). The methods used to assess handgrip MVCs shows considerable variation across studies. For instance, some measured handgrip MVCs at the beginning of the study, while others have measured it at the onset of each of training week or before each individual training session (23–25). In the latter case, authors of some studies have used the peak value, while others assessed the average of 3 maximal contractions to calculate the intensity of daily handgrip IRT sessions (25,26).

In studies that applied leg IRT, the most common protocol included 4 sets of 2 minutes performing an isometric wall squat at a participant-specific knee joint angle, interspersed by 2 minutes of seated resting (19). The intensity of wall squat isometric exercise is typically prescribed as the knee joint angle that elicits a target percentage of peak heart rate (HR; e.g., 95% of peak HR), determined during a previous incremental isometric wall squat test (27). The validity and reliability of the Isometric Exercise Scale (IES) for measuring rating of perceived exertion during an incremental continuous wall squat isometric exercise was recently evaluated (28). A strong positive linear relationship was reported between the IES exertion ratings and physiological (HR and BP) and external measures of exercise intensity (workload × duration), suggesting that this scale may be a useful and practical method for determining the intensity of lower limb IRT (28,29).

IRT can be conveniently conducted in various settings (such as home or office), using minimal and cost-effective equipment. Thus, it is considered a practical and time-efficient intervention compared with other more commonly recommended forms of exercise (i.e., aerobic and resistance) which may contribute to greater exercise adherence (30). Moreover, IRT may be a valuable alternative for patients who cannot engage in aerobic and/or resistance exercise, either temporarily (e.g., limiting weather conditions, money constraints, lack of motivation) or permanently (e.g., major physical limitations). The effectiveness of IRT as a nonpharmacological intervention to prevent and treat hypertension is recognized by prominent professionals and scientific societies such including the American College of Cardiology/American Heart Association Task Force (31) and Exercise and Sport Science Australia (32). However, some professional societies, including the International Society of Hypertension, the European Society of Hypertension, and the ACSM, do not recommend the inclusion of IRT as standalone therapy (6,13,33) for the treatment of hypertension due to persisting uncertainties regarding the effectiveness of lowering BP and cardiovascular risk in patients with hypertension (5,6,8,34). Additional data from randomized controlled trials and meta-analyses have been published recently highlighting the importance of updating the information (i.e., published guidelines, pronouncements, and statements) concerning the acute and chronic effects of isometric resistance exercise as well as their safety in patients with hypertension.

Effect During Isometric Exercise

Sustained handgrip contractions are associated with marked and continuous increases in SBP, diastolic BP (DBP), and mean arterial BP and more so with increasing duration and tension of the muscle contraction (35). These changes in BP during isometric exercise are associated with mild and widespread vasoconstriction as well as unchanged or decreases in stroke volume at higher isometric tensions. This contrasts with the typical hemodynamic response of aerobic exercise (36). Authors of a limited number of studies have investigated the BP response during acute handgrip exercise in patients with prehypertension and hypertension. Carlson et al. (37) found no difference in peak BP during 4 bouts of handgrip exercise at varying intensities among normotensive and prehypertensive individuals. The magnitude of SBP increase during moderate intensity handgrip exercise (30% MVCs) was comparable between normotensive and prehypertensive participants (39 versus 38 mm Hg). Furthermore, the maximal values of BP and the rate-pressure product (i.e., HR × SBP) attained were lower than those typically recorded during maximal aerobic exercise stress tests (37). No adverse events were reported in this study. Similarly, in research conducted on older, medication-treated, hypertensive women, researchers reported no differences in peak hemodynamic response after 2 isometric handgrip intensities (30% and 50% MVCs) compared with the control condition (38). Protocols used for both intensities used short-duration and low-volume isometric contractions which may have resulted in the absence of significant increases of BP.

Wiles et al. (27) evaluated the effects of leg IRT during wall squat isometric testing and exercise in 26 patients with hypertension. The peak SBP values reached 173 ± 21 mmHg (range 139–211 mm Hg) and 171 ± 19 mmHg (range 140–210 mm Hg) during isometric testing and the isometric exercise session, respectively. No patient reached values >250 mmHg in either the testing or exercise session. However, 12 patients during the incremental isometric testing and 6 patients during the isometric exercise session had DBP values >115 mmHg (27), an indicator of an excessive BP response (39). More investigative work is required to ensure that isometric leg exercise is appropriate and safe for all patients with hypertension, especially those with suboptimal BP control. To sum up, moderate intensity isometric handgrip exercise elicits a transient increase in BP. However, for most, this increase remains within safe levels.

Effect After Isometric Exercise

A reduction in BP is expected after an exercise session, an occurrence known as postexercise hypotension (PEH) (40). Previous research conducted in patients with unmedicated hypertension shows that PEH may persist for several hours after aerobic exercise (41). However, PEH has not been consistently observed across isometric exercise studies, particularly in those evaluating the long-term postexercise effects (up to 24 hours). Authors of one study reported that SBP was lower for 7 hours after a common handgrip IRT session (42). Despite the lack of statistical significance, a trend was noted toward a reduced DBP after isometric handgrip exercise. However, these findings contrast with the results of 2 other studies in which authors observed no differences in BP measured over a 24-hour period compared with patients with prehypertension and controlled hypertension (43,44). In summary, PEH has not been consistently observed after acute isometric handgrip exercise. More research is warranted to identify the sources of heterogeneity in the acute BP response to single sessions of isometric exercise.

Chronic Effects

Results from several meta-analyses suggest IRT prevents and controls high BP (45,46). In these meta-analyses, the mean reduction in SBP varied from 4 to 6 mmHg. Most of these studies included both normotensive and hypertensive individuals (45,46), and some authors reported inconsistent results for patients with hypertension (12).

Hansford et al. (20) performed a meta-analysis that included 24 randomized controlled trials with 1,286 participants with high normal BP or hypertension (stage I–II). IRT was performed on average for 3.2 sessions per week over 9.8 weeks with a mean duration of 15 minutes per session. Handgrip IRT was applied in most of the studies (88%) using 4 sets of 2-minute contractions at 30% MVCs. This meta-analysis showed office SBP decreased by 7 mmHg. However, significant heterogeneity was observed. Notably, similar SBP reductions were found among individuals with high normal BP (−7 mmHg) and stage I hypertension (−7 mmHg). When stratified according to the type of isometric exercise, the analysis revealed that office SBP decreased after isometric handgrip (−6 mm Hg) and leg training (−9 mm Hg), although evidence about the latter was calculated from only 4 studies (20).

The same meta-analysis reported a nonsignificant reductions of 3 mm Hg systolic and a 2 mm Hg reduction in DBP during 24-hour ambulatory measurement, respectively, after IRT (20). The absence of reductions in 24-hour, daytime, and nighttime ambulatory SBP and DBP after handgrip IRT was also reported in another meta-analysis (47). These recent findings should be interpreted with caution due to limited sample sizes of studies. These findings indicate that, while IRT demonstrates an effect in reducing resting BP, evidence regarding ambulatory BP is less conclusive.

Recently the European Association of Preventive Cardiology and the European Society of Cardiology Council on Hypertension published a consensus document on the effects of aerobic, dynamic resistance, combined, and isometric exercise on BP (8). The primary conclusion of this consensus statement recommended aerobic exercise as a first-line treatment for patients with hypertension. In addition, low- to moderate-intensity dynamic resistance exercise and IRT can be recommended as first- and second-line exercise treatment for the primary and secondary prevention of hypertension, respectively.

In summary, IRT is effective in reducing resting BP in patients with high normal BP and hypertension. Based on the latest evidence, the recommended FITT programming for isometric interventions for BP benefits should employ 3 sessions per week of 4 sets of 2 minutes of unilateral or bilateral handgrip muscle contractions at moderate intensity (30% MVCs). These sessions should be interspersed with 1–3 minutes of rest between work intervals, resulting in a total volume of 36–120 minutes per week. A greater exercise intensity may result in greater reductions in BP (23), although more research is warranted to determine the most effective protocol for achieving an optimal BP reduction. Some concerns have been expressed with the application of higher handgrip IRT intensities (≥50% MVCs) (29,48). However, authors of several acute and chronic studies have shown that they may also be applied without evidence of adverse events, particularly if the length of working intervals is shortened (e.g., 30–45 seconds) and enough recovery is provided (1–2 minutes) (21–23,38). Given that evidence is still limited in this regard, progression to higher intensities might be limited to patients with low cardiovascular risk. Although positive findings are documented concerning the chronic antihypertensive effects of leg IRT (19,49), more evidence is needed to confirm its effectiveness in patients both using and those not prescribed hypertensive medication.

YOGA

Originated in Northern India over 5,000 years ago, yoga practice in its modern form as a mind-exercise typically involves 3 key elements: physical poses, meditation/relaxation, and deep breathing. Yoga is highly popular with ~300 million people performing it worldwide (50), and 1 in 7 adults in the US practicing yoga (51).

Acute Effects

Authors of very few studies have investigated the acute effects of yoga practice on BP. These authors typically focused on the breathing and/or meditation/relaxation elements of yoga (52–55). For example, Telles et al. (52) randomized 90 adults with hypertension to a 10-minute alternate nostril yoga breathing group (n = 30), a 10-minute nonyoga breath awareness control group (n = 30), and a 10-minute magazine reading control group (n = 30). They found immediately after the 10-minute session alternate nostril yoga breathing reduced SBP/DBP from 134/86 mmHg to 128/84 mmHg ($P < 0.05$); breath awareness only reduced SBP from 131 to 127 mmHg ($P < 0.05$); while reading magazines did not alter BP. In another study, Ghati et al. (53) randomized 70 adults with hypertension to either yoga breathing practice with extended exhalation while listening to a humming bee sound for 5 minutes (n = 35) or to yoga practice breathing with slow inhalation and exhalation while making a "SSSS" sound for 5 minutes (n = 35). They did not find any significant within- or between-groups changes for SBP or DBP immediately after the 5-minute practice.

Overall, in this small body of literature, there is noticeable heterogeneity in the magnitude of the BP changes, type/style, and length of yoga practice as well as the activity of the control groups. In addition, none of the authors investigated the duration that BP reductions were sustained after the 1 session of yoga practice under ambulatory conditions. Therefore, the evidence is inconclusive about the acute effect of yoga on BP.

Chronic Effects

The chronic effects of yoga on BP are more well documented than the acute effects. In 2019, Wu et al. (9) performed a meta-analysis which included 49 studies involving 3,517 participants. They found that, overall, among adults with hypertension, yoga reduced SBP/DBP by 6/3 mmHg. However, if both meditation/relaxation and breathing were emphasized, yoga reduced SBP/DBP by 11/6 mmHg. Since 2019, authors of several meta-analyses showed similar findings to Wu et al. (9) regarding the overall BP benefits of yoga. For example, Nalbant et al. (56) meta-analyzed 34 randomized controlled trials with 13,130 participants and found yoga reduced SBP/DBP by 7/3 mmHg among adults with prehypertension and hypertension. Of note, authors of these more recent meta-analyses did not attempt to estimate the BP reduction effect of specific types or the FITT of yoga practice. However, Nalbant et al. (56) reported that authors that concluded yoga is effective in reducing BP had a relatively even distribution of time spent in physical postures (19 minutes), meditation/relaxation (14 minutes), and breathing (9 minutes); whereas the authors that concluded yoga was not effective focused heavily on physical postures (42 minutes) than on meditation/relaxation (9 minutes) and breathing (8 minutes). Collectively, the current evidence suggests yoga can reduce SBP/DBP by ~6/3 mmHg among adults with hypertension. Importantly, if one practices all 3 elements of yoga for a similar amount of time, BP reductions appear to be increased or even doubled to the extent that can rival or exceed those reported from aerobic and resistance exercise alone or combined (45,57,58).

Despite promising evidence supporting the BP benefits of yoga, it remains unclear if it is feasible to implement yoga as an antihypertensive treatment outside of a well-controlled research environment. Based on the meta-analyses of Wu et al. (9) and Nalbant et al. (56), the FITT recommendations of yoga interventions yielding the greatest BP benefits are 45–60 minutes per session for 5–7 days per week totaling 225–420 minutes per week. This weekly volume of yoga practice far exceeds the current ACSM recommendations of 90–150 minutes per week and could be challenging for adults with hypertension to adhere to, considering this population is not typically physically active (5,16). Furthermore, yoga practice has many styles (e.g., hatha, vinyasa, kundalini) of which the BP benefits have not all been adequately studied. Therefore, health care providers and patients with hypertension may explore different yoga styles together for the maximum BP benefits while ensuring safety and long-term adherence.

Overall, results from research studies support the long-term BP benefits of yoga practice. However, the effectiveness of yoga as an antihypertensive lifestyle therapy in the real world versus the research setting still needs to be confirmed.

EXERCISE IN AN EMERGING PATIENT POPULATION: RH

RH is an increasingly common clinical condition defined as uncontrolled BP on 3 different antihypertensive medications of different classes or controlled BP on 4 or more (31,59). This section focuses on continuous moderate to vigorous aerobic exercise as evidence-based antihypertensive lifestyle therapy in this population, as the evidence relies on this type/mode of exercise.

Acute Effects

The BP response to an acute bout of exercise in patients with RH or PEH is relatively similar to that observed in adults with and without hypertension. Santos et al. (60) reported an immediate reduction in ambulatory BP after a 45-minute session of aerobic exercise of light (50% of maximum HR) and moderate (75% of maximum HR) intensity in 20 patients with RH that was sustained for up to 5 hours (changes compared with control session, light: −8/−6 mmHg; moderate: −9/−4 mmHg). Interestingly, the reductions in BP persisted longer after the session at light than at moderate intensity. Pires et al. (61) compared the BP effects of an acute aerobic, dynamic resistance, and combined exercise session in 10 patients with RH. Overall, BP was reduced after the 3 exercise modalities with BP reductions of greater duration after combined exercise (~12 hours) followed by aerobic exercise (~6 hours) and dynamic resistant exercise (−3 hours).

A recent report of the Exercise Training in the Treatment of RH (EnRicH) trial also suggested that a single bout of aerobic exercise decreased SBP by 9 mmHg, the mean value obtained from 3 exercise sessions conducted during the third week of the intervention in patients with RH (62). Of note, in the EnRicH trial, the acute reduction in SBP at the third week of the intervention predicted the reductions in 24-hour ambulatory SBP after the 12-week aerobic exercise intervention.

It is noted that data regarding the BP effects of acute exercise in patients with RH are limited. More research on PEH induced by other modes of exercise, namely, IRT, is needed.

Chronic Effects

Several randomized trials (63–66) have confirmed the efficacy of aerobic exercise interventions in the management of BP among patients with RH. Recently, the EnRicH trial (63) showed that 12 weeks of aerobic exercise training promoted a clinically meaningful reduction in 24-hour (6/4 mmHg) and daytime (7/5 mmHg) ambulatory BP and office 11/6 mmHg) BP compared with the control arm. The Treating RH Using Lifestyle Modification to Promote Health (TRIUMPH) trial (64) also supports the benefits of aerobic exercise as a part of a 4-month multicomponent lifestyle intervention to reduce BP in this population. An intervention including dietary counseling (DASH diet with caloric and sodium restriction), behavioral weight management, and supervised aerobic exercise training reduced office (13/6 mmHg) and 24-hour ambulatory SBP and DBP (7/4 mmHg). Authors of a small pilot study (67) compared the effects of 12 weeks, 3 sessions per week, of aerobic (n = 6) versus dynamic resistance exercise (n = 5) training in patients with RH. The dynamic resistance sessions were composed of 10 exercises organized in circuit with 3 sets of 10 repetitions. After 12 weeks, only the aerobic exercise training group decreased 24-hour ambulatory SBP and DBP (14/7 mmHg).

In summary, aerobic exercise alone or as part of a lifestyle program reduces BP in RH. Further studies determining the effects of other modes of exercise are needed; namely, dynamic resistance, IRT, and yoga are necessary.

THE NEW PRACTICAL FITT EXERCISE PRESCRIPTION CONSIDERATIONS

The recent evidence discussed in this review expands upon the current ACSM FITT exercise prescription recommendations for hypertension in Table 1 in 2 ways (16). First, this new evidence has shown nontraditional mind-body types of exercise such as yoga and tai chi reduce BP to similar or even greater levels than those BP levels reported from traditional types of exercise including aerobic and dynamic resistance exercise performed alone or combined (9,10,34,68). Therefore, we propose that nontraditional mind-body types of exercise should now be recommended as an added exercise option to aerobic, dynamic resistance, and concurrent exercise to treat and control hypertension when all 3 elements of yoga that include physical postures, meditation/

TABLE 2. FITT recommendations for isometric resistance exercise (adapted from (20–23).

FITT	
Frequency	3×/wk
Intensity	30% of MVC
Time	4 × 2 min
Type	Unilateral or bilateral handgrip exercise
Resting	1–3 min between contractions
Volume	36–120 min/wk
Progression	Intensity may increase (up to 60% MVC), but the length of working intervals must be shortened appropriately (30–45 s), and enough recovery between contractions must be provided (1–2 min)[a]

FITT = frequency, intensity, time, and type; MVC = maximal voluntary contraction
[a]Since evidence is still limited about the effects of isometric handgrip exercise >30% of MVCs, progression to higher intensities should be recommended to patients with low cardiovascular risk

relaxation, and breathing are practiced (34,68). Accordingly, the current ACSM FITT exercise prescription recommendations should be expanded to include neuromotor exercise as an exercise option.

Second, new evidence has shown handgrip IRT exercise lowers office SBP 4–7 mmHg but not 24-hour ambulatory SBP (20,47). The magnitude of these office SBP reductions approximate the magnitude of those elicited by aerobic, dynamic resistance, and combined exercise (8), although heterogeneity and inconsistency remain in this literature. Based upon this emerging evidence, we propose that handgrip IRT should be recommended as an alternative exercise modality to aerobic, dynamic resistance, and combined exercise among patients with hypertension who are not able to perform or do not like, and thus do not adhere to, aerobic, dynamic resistance, and combined exercise (Table 2). Adding handgrip IRT as an alternative to aerobic, dynamic resistance, combined, and now neuromotor exercise in the ACSM FITT exercise prescription recommendations is consistent with recommendations by several professional societies (31,32,69) and provides more exercise options for adults with hypertension. Nonetheless, considering the limited size, heterogeneity, and inconsistencies in this literature, the antihypertensive effects of IRT remain to be more firmly established.

CONCLUSIONS

The latest evidence supports the addition of nontraditional mind-body and isometric exercise into the recommendations for patients with hypertension, providing the patients with a greater number of exercise resources to control their BP according to their preferences, limitations, and lifestyle. This expanded array of exercise options may also promote adherence to physical activity within the general population and optimize both primary and secondary prevention strategies against hypertension. However, several questions remain unresolved in the literature. The feasibility and effectiveness of mind-body exercise as an antihypertensive treatment in ecological real-world environments still needs to be investigated. The underlying antihypertensive mechanisms of mind-body exercises also remain unclear. In addition, even though moderate-intensity isometric exercise appears to safe and effective, the optimal FITT programming still needs further investigation.

In patients with RH, exercise researchers have also witnessed significant advancements in recent years. Emerging independent randomized controlled trials clearly support aerobic exercise training as part of the standard care for patients with RH. However, the impact of alternative exercise modalities on BP remains unclear in this patient population and needs further investigation.

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