HUR

Hyper-tension

Introduction

The HUR hypertension concept is designed to be used in strength training as a therapeutic modality in treatment of elevated blood pressure (BP) by using the HUR's Natural Transmission method.

The Natural Transmission Method is a resistance strength training method based on pneumatic technology. The method allows for resistance to be adapted in response to the muscle's own force production, regardless of the speed of movement. An intelligent technology system for automated reporting, close to zero starting load, 100 g/1 kg increments in resistance, range limiters and additional support with connected outcome measures to document the effectiveness, enables the user to start strength training safely when considering the individual treatment prescriptions, e.g., appropriate medication.

The HUR hypertension concept helps the rehabilitation professionals to provide the best practice of exercise-as-medicine, based on the latest international treatment guidelines, to help individuals with elevated blood pressure levels engage in regular weekly physical activity and to follow an exercise training regimen.

Contents

Hypertension concept: Background and overview

Hypertension is a major independent risk factor for cardiovascular diseases including all age, race and gender groups. Hypertension is defined as a systolic blood pressure (SBP) of ≥140 mm Hg or a diastolic blood pressure (DBP) of ≥90 mm Hg and/or the current use of antihypertensive medication.

Approximately 65 million adult American adults have hypertension, and its prevalence has been found to be about 30-45% of the general population in Western Europe.

Lifestyle factors are recognized as major modifiable determinants of hypertension. Recent guidelines emphasize, in addition to medical treatment, the assessment of

lifestyle, particularly as it relates to diet and exercise, and the management of obesity and dyslipidemia as key factors in the treatment of hypertension.

Large body of evidence shows that exercise training elicits BP reduction in both normotensive and hypertensive individuals. The mean training-induced reductions in SBP and DBP have varied from –3 to –11 mmHg and from –2 to –6 mmHg, respectively. The BP lowering effect of exercise training is assumed to be multifactorial, but appears to be independent of weight loss. The mechanisms include neuro-hormonal, vascular, and structural adaptations. Decreases in catecholamine levels and total peripheral resistance, improved insulin sensitivity, and alterations in vasodilators and vasoconstrictors are some of the postulated explanations for the antihypertensive effects of exercise.

The HUR hypertension concept helps the health care professional to provide the best practice of exercise-as-medicine, based on the latest international treatment guidelines, to help individuals with elevated blood pressure levels to engage in regular weekly physical activity and to follow an exercise training regimen.

The role of strength training in treatment of hypertension

Both regular endurance and strength training are important determinants of the treatment of hypertension. Endurance training is recommended as first-line antihypertensive lifestyle therapy based on convincing evidence showing that it lowers BP at average level of –5 to –7 mmHg among adults with hypertension. Because of weaker evidence showing that dynamic strength training reduces BP –2 to –3 mm Hg among adults with hypertension, it is recommended as adjuvant lifestyle therapy to endurance training.

However, latest meta-analysis shows that for nonwhite adult samples with hypertension, dynamic strength training elicits BP reductions that are comparable to or greater than those reportedly achieved with endurance training.

Therefore, strength training should be further investigated as a viable stand-alone therapeutic exercise option for adult populations with high BP.

Outcome measures

To gather information on the baseline status and effectiveness of exercise training, each patient is evaluated individually. The main objective is to achieve and maintain an optimal BP level. Since both cardiorespiratory and muscle fitness have prognostic value in hypertensive patients, they can be recommended as main outcome measures of exercise training interventions.

Assessment of blood pressure, lipid profile, body weight is highly recommended to be used as outcome measures. Furthermore, when existing co-morbidities or other needs are registered, other appropriate outcome measures may be performed. These may include assessment of balance, and questionnaires related to an individual's experience of pain, symptoms of depression, and health-related quality of life.

The maximal isometric strength of big muscle groups can be evaluated by the HUR Performance Recorder for the assessment of side-to-side differences and to document changes in strength after the intervention.

The Performance Recorder can be directly connected to all HUR exercise machines, which are equipped with the isometric testing sensor attachment.

Recommended HUR equipment for treatment of hypertension

HUR BP GYM

1 5540
LEG PRESS
REHAB

2 5310
3 ABDOMEN/
BACK REHAB

4 5140
CHEST PRESS
REHAB

5 5120
6 PUSH UP/
PULL DOWN REHAB

7 5520
8 ADDUCTION/
ABDUCTION REHAB

9 5175
OPTIMAL RHOMB
REHAB

10 5340
11 TWIST REHAB

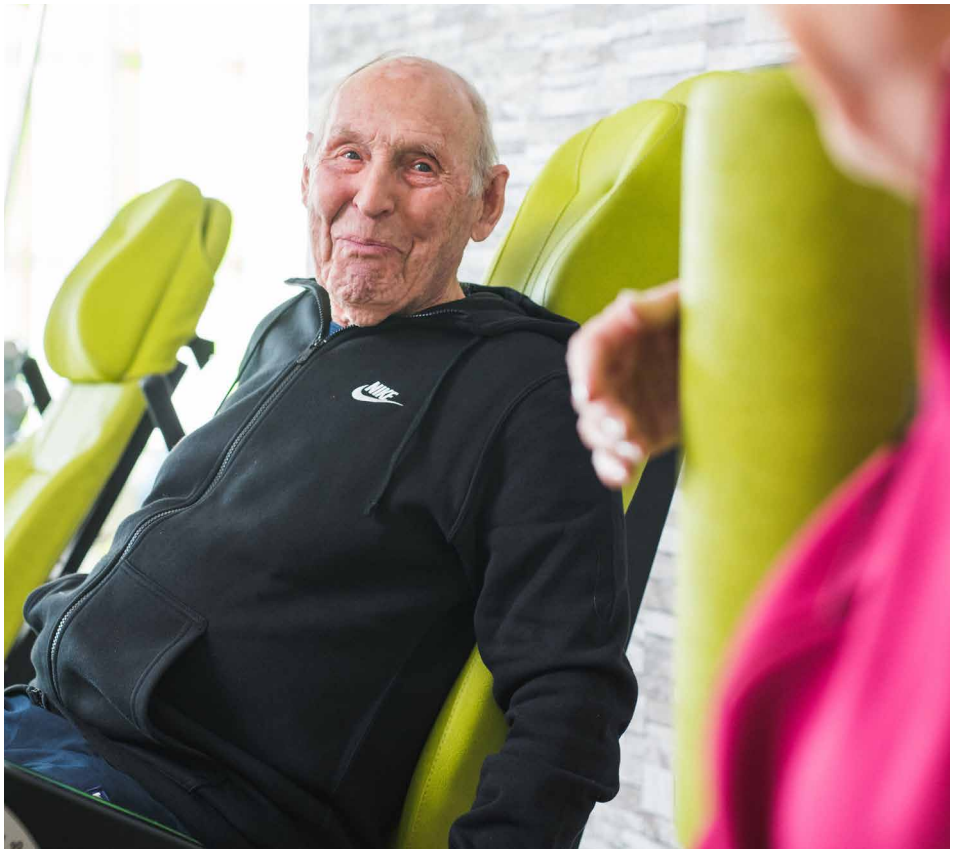
12 5530
13 LEG EXTENSION/
CURL REHAB

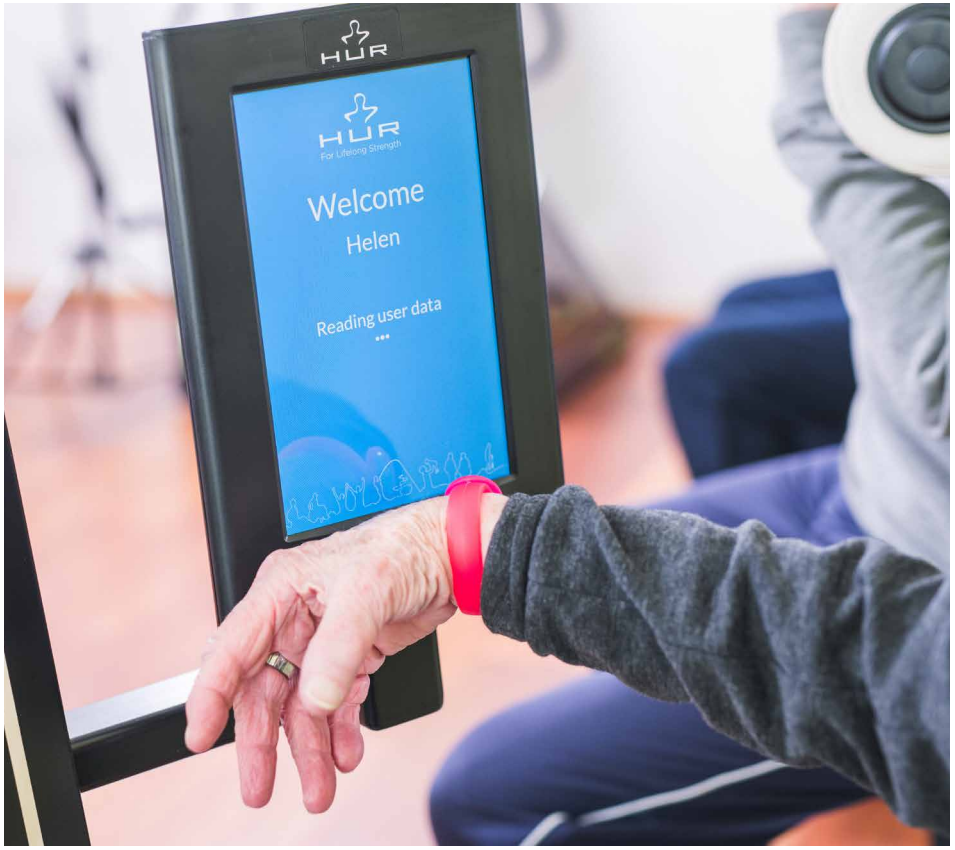
for 5-10 min
warm-up and
cool-down
for example:

Performance
Recorder PR1

Strength training prescription for HUR devices for hypertension

Regular exercise training - including both endurance and strength training - is considered as a cornerstone of the primary and secondary prevention of hypertension. Outlines for six-month workout programs (both beginner and advanced) and a recommended set-up for HUR intelligent strength training devices are presented below.





Strength training program for hypertension patients (beginner and advanced) for six months.

Hypertension, Strength Training program for 24 weeks: **Beginner**							
Week	Weekly volume	Series	Reps	% 1-RM	RPE	Rest intervals	Stage
1 - 2	1-2	1	15	30 - 40	10	60 - 90	Familiarization
3 - 4	1-2	1	15	30 - 40	10	60 - 90	Familiarization
5 - 6	2	1	12 - 15	40	10	60 - 90	Familiarization
7 - 8	2	1-2	12 - 15	40	10 - 12	60 - 90	Training
9 - 10	2	1-2	12 - 15	40	10 - 12	60 - 90	Training
11 - 12	2	1-2	12 - 15	40	12	60 - 90	Training
13 - 14	2	2	10 - 12	40 - 50	12	60 - 90	Training
15 - 16	2	2	10 - 12	40 - 50	12	60 - 90	Training
17 - 18	2 - 3	2 - 3	10 - 12	50 - 60	13	60 - 90	Training
19 - 20	2 - 3	2 - 3	10 - 12	50 - 60	13	60 - 90	Training
21 - 22	2 - 3	2 - 3	8 - 12	60 - 70	13 - 14	60 - 90	Training
23 - 24	2 - 3	2 - 3	8 - 12	60 - 70	13 - 14	60 - 90	Training

*__Weekly volume:__ exercise sessions weekly
__Series:__ series for each muscle or muscle group
__Reps:__ repetitions in each series
__% 1-RM:__ % of one repetition maximum
__RPE:__ ratings of perceived exertion (Borg's scale 6-20)
__Rest intervals:__ in seconds
__Stage:__ target level of exercise training.

Hypertension, Strength Training program for 24 weeks: **Advanced**							
Week	Weekly volume	Series	Reps	% 1-RM	RPE	Rest intervals	Stage
1 - 2	2 - 3	2	12	60	12	60	Training
3 - 4	2 - 3	2	12	60	12	60	Training
5 - 6	2 - 3	2	12	60	12	60	Training
7 - 8	2 - 3	2 - 3	10 - 12	60 - 70	12 - 14	60	Training
9 - 10	2 - 3	2 - 3	10 - 12	60 - 70	12 - 14	60	Training
11 - 12	2 - 3	2 - 3	10 - 12	60 - 70	12 - 14	60	Training
13 - 14	2 - 3	2 - 3	10 - 12	60 - 80	12 - 14	60	Training
15 - 16	2 - 3	2 - 3	10 - 12	60 - 80	12 - 14	60	Training
17 - 18	2 - 3	3	8 - 12	60 - 80	14 - 16	60	Maintenance
19 - 20	2 - 3	3	8 - 12	60 - 80	14 - 16	60	Maintenance
21 - 22	2 - 3	3	8 - 12	60 - 80	14 - 16	60	Maintenance
23 - 24	2 - 3	3	8 - 12	60 - 80	14 - 16	60	Maintenance

*__Weekly volume:__ exercise sessions weekly
__Series:__ series for each muscle or muscle group
__Reps:__ repetitions in each series
__% 1-RM:__ % of one repetition maximum
__RPE:__ ratings of perceived exertion (Borg's scale 6-20)
__Rest intervals:__ in seconds
__Stage:__ target level of exercise training.

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NOTE: The treatment of diseases should always follow the quidelines given by the treating party.