Gym program

Introduction

When thinking about cardiac rehabilitation, most people only imagine doing long, light, endurance type of exercises. Indeed, endurance training is an important part in cardiac rehabilitation and how to do this is discussed elsewhere. However, more and more research has been done concerning the use of resistance training or strength training for cardiac patients. Strength training on its own can have a number of positive effects, which are listed below.

- It increases strength

- It increases muscle mass if you train long enough

- It increases muscle quality (when you get stronger without gaining muscle mass)

- It can control your body weight and adipose tissue mass

- It increases your resting metabolic rate (which can have positive effects on your body weight)

- It increases basal insulin levels

- It lowers your blood glucose level

- It lowers your resting blood pressure

- It lowers your HbA_{1c} value if you are pre-diabetic or diabetic

- It delays the onset of a multitude of arthritic problems

- It increases your bone density

- It increases your quality of life

You can clearly see that implementing strength training in your exercise regimen is a logical thing to do. Most medical guidelines stress the importance of strength training as an adjunct to endurance training. We therefore recommend to do 2-3/week a strength training session in combination with endurance training. This may seem a lot to ask, but when you have already incorporated endurance training in your daily life (e.g. walking/cycling for transportation) you only have to make yourself free for 30 minutes a couple of times per week. There are a lot of different ways to do strength training. You can do it at your home, using your own bodyweight or light equipment. In the 'Exerclass' section of the PATHway platform you can find a 'ground-exercises' section which already includes a lot of functional strengthening, stabilizing and stretching exercises. If you want to do other exercises as presented there, you can find some exercises below, often using simple equipment like a fitness-ball or dumbells (water bottles). You can also subscribe to a gym, where you can enjoy advanced equipment and professional guidance during the first training sessions. This guidance might be important when you are progressing your training and start lifting heavier weights. Strength training has been reported as having a low risk of injury, but this assumes a correct execution of exercises!

Below we will outline the basics of strength training, so you can apply them to yourself and adapt the training to your own needs. Be creative! Even everyday movements can become an exercise when

you repeat them several times in a row and add some weight to them. A separate section of this document will be dedicated to the more structured strength training programs.

Correct posture

Correct posture is very important when lifting weights to prevent injury. If you train in a gym, there will be professionals you can ask for help. If you are on your own, or there is no help available, think logical before you start. Most of the time, general rules that also apply in daily life should be kept in mind. Never lift a heavy weight with a bend back, never do sudden or uncontrollable movements, go through the full range of motion, don't overdo yourself etc. Generally it is advised to lift the weight up in 3 seconds and lower it back down in 3 seconds. Very important for cardiac patients lifting heavy weights is to remember to KEEP BREATHING. You can easily achieve this by BREATHING OUT WHEN YOU LIFT, PUSH, PULL, ...

Getting started and building up

When starting with strength training, you should first consider the muscles you want to train. If you really like strength training or going to the gym, you can train a different part of your body every time you go to the gym. This allows you to go hard on that body part, because it can rest the following days. For the less frequent exerciser, it is recommended to do a full body workout 2-3 times/week. For both types of exercisers, specific training schedules will be presented below.

However, in both cases it is important to build up gradually. When you start with strength training, your body needs to adapt itself to this new movements and increased weight it has to overcome. Therefore, you should start with relatively low weights (e.g. 50% of your maximum) and a relatively high number of repetitions and sets (e.g. 4-5 sets of 15 repetitions). If you don't know what is meant by relative weight, repetitions and sets, a definition is given here:

- **Repetitions**: The number of times you need to lift, push, pull... a weight. Between repetitions there is no rest.

- **Set**: A set consists of a given number of repetitions. Between sets there is a resting period. (e.g. perform 4 sets of 15 repetitions with 1 minute rest between sets)

- **Relative weight**: a percentage (%) of the maximum weight you can lift, push, pull,... During your first training session you need to determine this maximum weight. When in a gym, you can surely address a professional to help you with that. If you want to do it on your own, this is how it works: : 1) warm-up, 5-10 reps with low resistance 2) rest during 1-2 minutes 3) 3-5 reps with medium-high weight 4) Try a weight you think is your max. If too easy, wait for 3 minutes and try a heavier weight. If too heavy, try a lighter weight. 5) You now have what we call, your 1 repetition maximum (1RM). A lot of training programs you find online are based on percentages of this 1RM. *Note:* When you progress in your training program and become stronger, you should retest yourself and determine again your 1RM.

After you have gone through the adaptation phase (generally 4-6 weeks), you can start adding weight and lower the number of sets and repetitions. Eventually we would like you to work towards 3 sets of 8-12 repetitions with a weight which is 85% of your current 1RM. Try to incorporate around 9 exercises for different body parts.

General training routines and exercises

Training routines

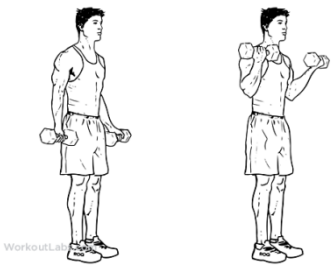
When starting, use the same number of repetitions and the same weight per set. Later you can spice it up by using the same number of repetitions per set, but changing the weight per set (e.g. 1 set of 12 repetitions at 50% 1RM, 1 set of 12 repetitions at 60% 1RM, 1 set of 12 repetitions at 70% 1RM). Additionally, you can try to do a pyramid-sequence where the number of repetitions and the weight changes per set (e.g. 1 set of 15 repetitions with 60% 1RM, 1 set of 10 repetitions with 75% 1RM, 1 set of 8 repetitions with 85% 1RM). *Note: There is always a trade-off between number of repetitions and weight when you go above 70% 1RM.*

Supersets and compound sets: These are 2 ways you can let exercises follow each other. When you train in the "superset" form, you switch muscles when you switch exercises. However, you keep training the same body part. An example is when you first train your biceps and the next exercise is for your triceps. Another example is training the quadriceps followed by the hamstrings or a chest exercise followed by a back exercise. "Compound" training is when you do all the exercises for one muscle group first, before going to the next muscle group. For example, first you do all the leg exercises before continuing with all the arm exercises. We would advice to start with the "superset" training before going to the "compound" mode of training.

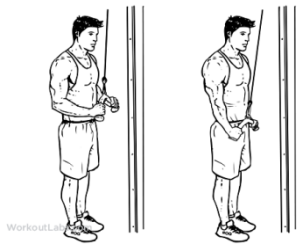
Circuit training: This is a great way to not only work on strength but to also implement a form of cardio into your workout. Make an order of exercises that target different parts of your body when you move from exercise to exercise (e.g. arms, legs, trunk, shoulders, arms, legs, trunk, shoulders). You now perform only 1 set of each exercise and allow yourself no rest between exercises. If you normally do 3 sets of each exercise, you repeat this routine 3 times. The only moment rest is allowed is when you finish the circuit and prepare yourself to go at it for the second or third time.

General exercises

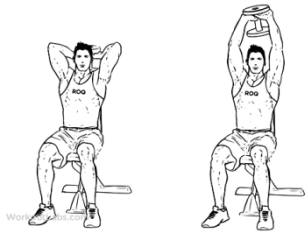
- Dumbbell curl



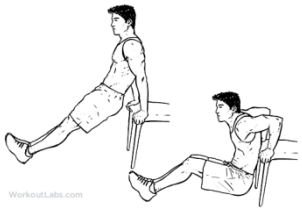
- Triceps pushdown



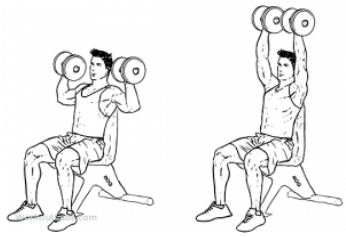
- Triceps extension with dumbbell



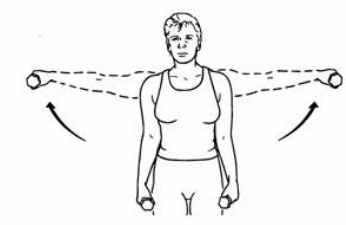
- Dips



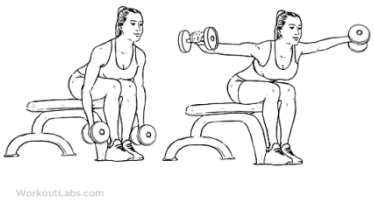
- Dumbbell shoulder press



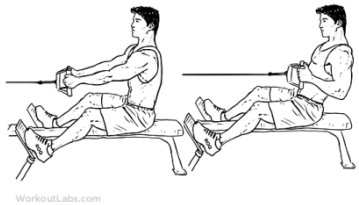
- Shoulder abduction



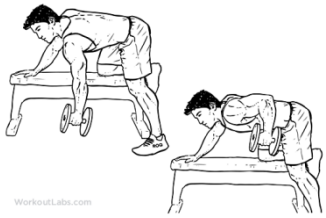
- Bent over raise



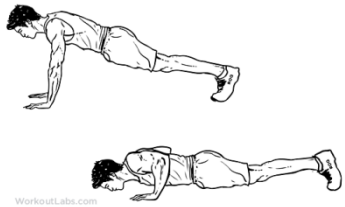
- Seated cable row



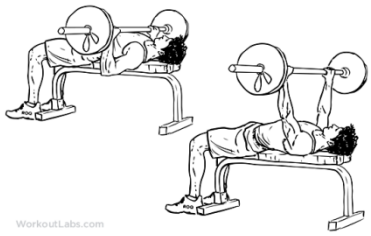
- Bend over dumbbell row



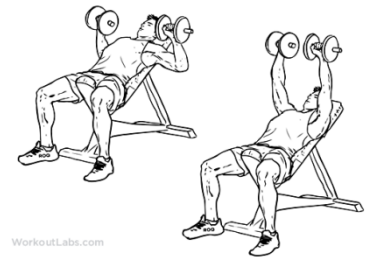
- Push-up



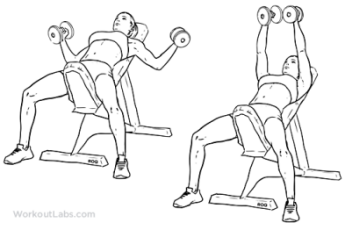
- Bench press



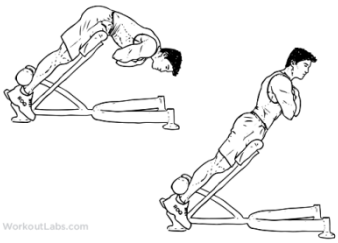
- Inclined dumbell press



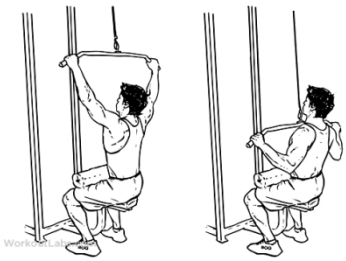
- Fly's



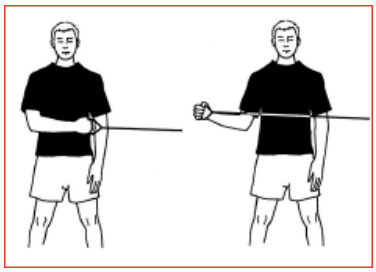
- Back extension



- Lat pull down



- Exorotation of the shoulder



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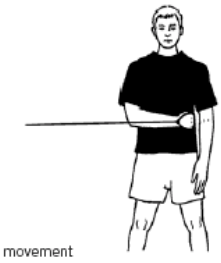
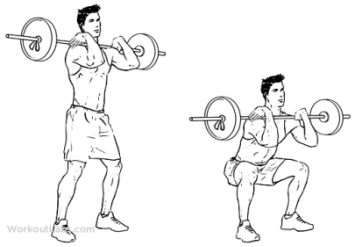
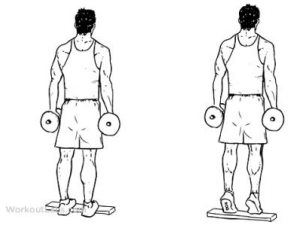


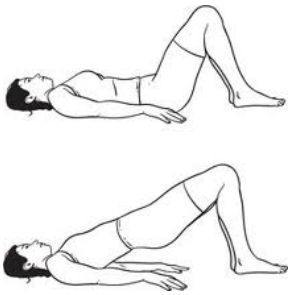
- Front squat



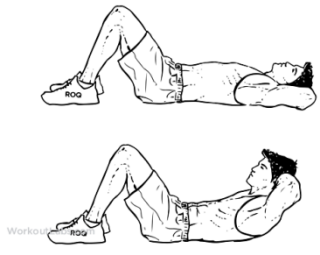
- calf raise



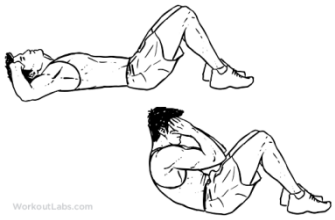
- Pelvis lift



- Crunches

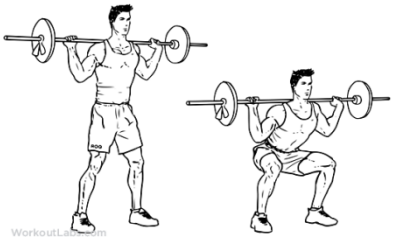


- Sit-ups



- Leg press

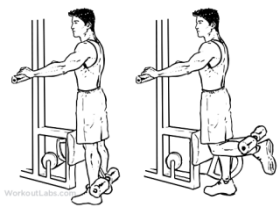
- Squat



- Leg adduction

- Leg abduction

- Hamstring curl



Specific training program

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Body part	Legs and lower back	Rest	Chest triceps and abs	Rest	Back and biceps	Rest	Rest
Training	- Squats(3x12) - Leg press (3x12) -Hamstring curls (3x12) - Back extensions (3x12) 45" rest between sets		- Incline dumbbell press (3x12) - Fly's (3x12) - Bench press (3x12) - Triceps extensions (3x12) - Crunches (3x20) - Sit-ups (3x15) 45" rest between sets		- One arm dumbbell row (3x12) - Lat pull down (3x12) - Seated cable row (3x12) - Back extensions (3x12) - Biceps curls (3x12) 45" rest between sets		

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Body part	All	Rest	All	Rest	All	Rest	Rest
Training	Circuit (x3) Dips (x15) Crunches (x20) Leg press (x12) Shoulder press (x12) Biceps curls (x12) Back extensions (x15) Squats (x12) Seated cable row (x12) 120" rest between circuits		Circuit (x3) Push-ups (10x) Sit-ups (15x) Hamstring curls (x12) Lat pull down (x12) Fly's (x12) Back extensions (x15) Calf raises (x15) Exorotation shoulder (x12) Bench press (x12) Crunches (x20) Leg abduction (x12) Endorotation shoulder (x12) 120" rest between circuits		Circuit (x3) Inclined dumbbell press (x12) Sit-ups (x15) Pelvis lift (x15) Bend over dumbbell row (x12) Push-ups (x10) Back extensions (x15) Leg adduction (x12) Bend over raises (x12) Bench press (x12) Crunches (x20) Front squat (x12) Shoulder abduction (x12) 120" rest between circuits		

Tips and tricks

- You can make a lot of the aforementioned exercises more difficult by adding an unstable surface like a fitness-ball as your support

- Separate heavy strength training sessions at least 48h

- When you gain strength in e.g. your legs, this does not necessarily translate to better functional performance. You will still need to walk, cycle etc. to transfer your strength gains to those activities

- When you stop training, the accomplished results will disappear

- If you want to improve a certain movement, you will need to do exercises that resemble that movement as much as possible

- In the beginning you will make progress fast, after a while it is natural that progress doesn't come that easy anymore

- Some people react better to strength training than others. There are inter individual differences between persons. Don't get discouraged when you don't progress as much/fast as someone else

- It is important to increase resistance and eventually frequency and duration of your training sessions if you want to keep making progress

- Stretch after each strength training session. It helps to deal with muscle soreness the days after training. Adequate stretching exercises are offered in the "Exerclasses" provided in PATHway

References

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