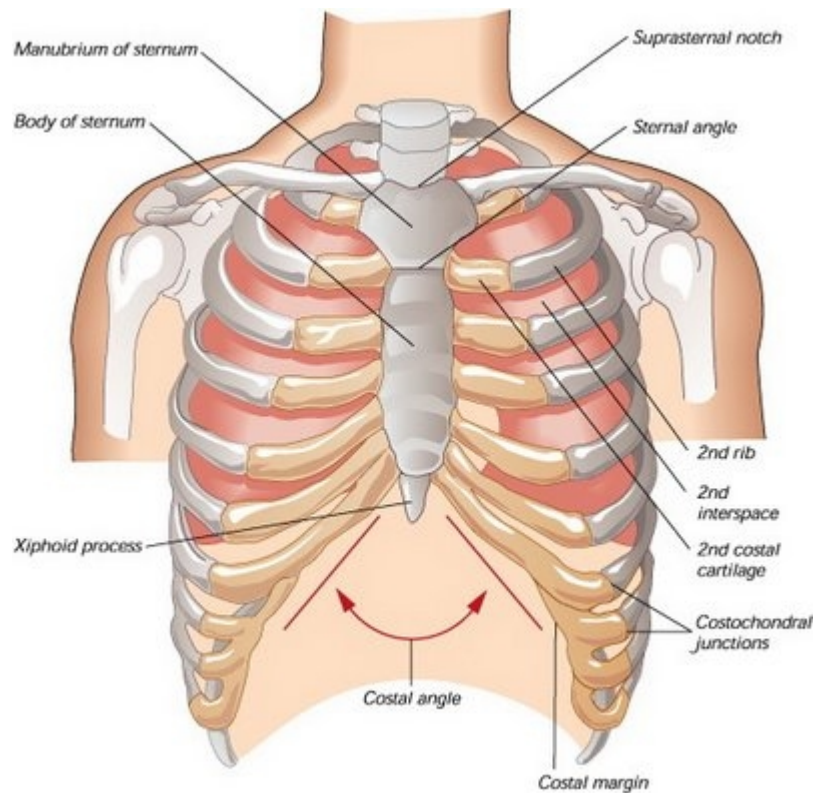


# Rib Cage Expansion

Lung Capacity &

Vo2max

By Gareth Thomas



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First up welcome to this special report. I intended to write this up some time ago to complement a blog post on the subject of “rib cage expansion”. Time passed by and now after prompting from a youtube viewer here is the report.

I have been lifting for over 20 years and as a teen I embraced a rib cage expansion program and benefited greatly from it. It was much to my surprize then while researching for this report I found that there is considerable controversy over “rib cage expansion” and “hypoxic training” both of which I am a personal proponent of through experience.

Even the popular TV show myth busters has attempted to

discredit “rib cage expansion”. Personally I think this is just plain dumb. The physiology behind this training seems perfectly sound to me. Perhaps the pencil necks at mythbusters just didnt try hard enough ? I dont know because I didnt see the show – dont watch it.

Anyway this report is written for people seeking information on techniques to increase lung capacity, chest girth and VO2max. Most of these methods I have used myself. This information is useful to bodybuilders, free divers, singers and musicians to name but a few.

Let me say up front YES you can substantially increase your lung capacity and VO2max and if you are a teenager you can also substantially increase the girth of your rib cage but it will take several months of diligent effort to do so.

As a teen I was plagued by drug addiction, alcoholism and almost anorexia. At sixteen I weighed just 6 stone (84 lbs).

I was chain smoking 2 packs of cigarettes a day plus a large 1 oz bag of pot. I was drinking spirits, popping pills. It all nearly killed me so I gave it up and took to weight training. My weight doubled in the first six months. I went from wheezing and coughing up brown lumps of flem all day to being a young athlete. Full of energy. 24 years on I am still drug and alcohol free – never used steroids either.

Part of my early training was the “rib cage expansion” routine. I had to do this to recover my lung capacity.

Teenagers will definitely get the best results from this program because the cartilage in their chest, connecting to the sternum is still soft. Over several months of deep breathing and stretching this cartilage can be stimulated to grow thus expanding the rib cage and allowing for larger expanded lungs. For an adult it may take years of training rather than months as the cartilage calcifies and fuses during the middle age years. Many parts do not ossify until well into middle age however.

None the less actual lung capacity and oxygen uptake can

still be rapidly improved for mature adults and moderate expansion of the upper torso can be achieved. Only with appropriate effort though. You may judge that for you it simply is not worth it.

On the other hand I hope you decide that it is worth it and you want to go for it.

This report will roughly be divided into three sections.

1. Rib Cage Expansion
2. Lung Capacity Training
3. Increasing VO<sub>2</sub>max

There is of course overlap between the three. Please be tolerant if I appear to repeat some of the information.

## **Rib Cage Expansion**

As we have already stated this works best for teenagers.

If you are a teen and are prepared to do the work you could

see several inches added to the chest girth from this training to expand the cartilage that connects to the sternum.

Do not expect to quickly see a seven inch gain from this if you are a middle aged developed adult !!!

**But its still worth doing for the benefit to your lungs.**

There are four main exercises in the rib cage expansion program. The exercises should be performed 3 – 5 times per week with up to 3 sets per exercise of 20 reps. Start off at one set 3 times per week and increase as you feel more capable. You should first increase sets EG: up to 3 sets per exercise 3 days per week then go back to one set per exercise and add another training day.

1. Breathing Squats
2. Breathing Pullovers
3. Dumbell Flyes
4. Rader Chest Raise

## Breathing Squats



Lets look at the first of these – the breathing squat.

Use a light weight – there should not be serious muscular exertion with regard to the weight – you could pass out.

At the top of the exercise you normally take one breath between squats, now you will take 3-5 breaths. Slow, deep breaths that fully and forcefully expand your lungs.

The squat is itself done with “FULL LUNGS” so essentially you hold your breath while performing first part of the squat.

Then exhale as you rise from the bottom of the squat.

This is why I discourage doing the exercise with heavy weight.

Breathe through the mouth while performing the exercise.

This is done for 20 reps and is followed by the breathing pullover exercise.

Another popular routine for the breathing squats is as follows:

10 reps with 3 breaths between

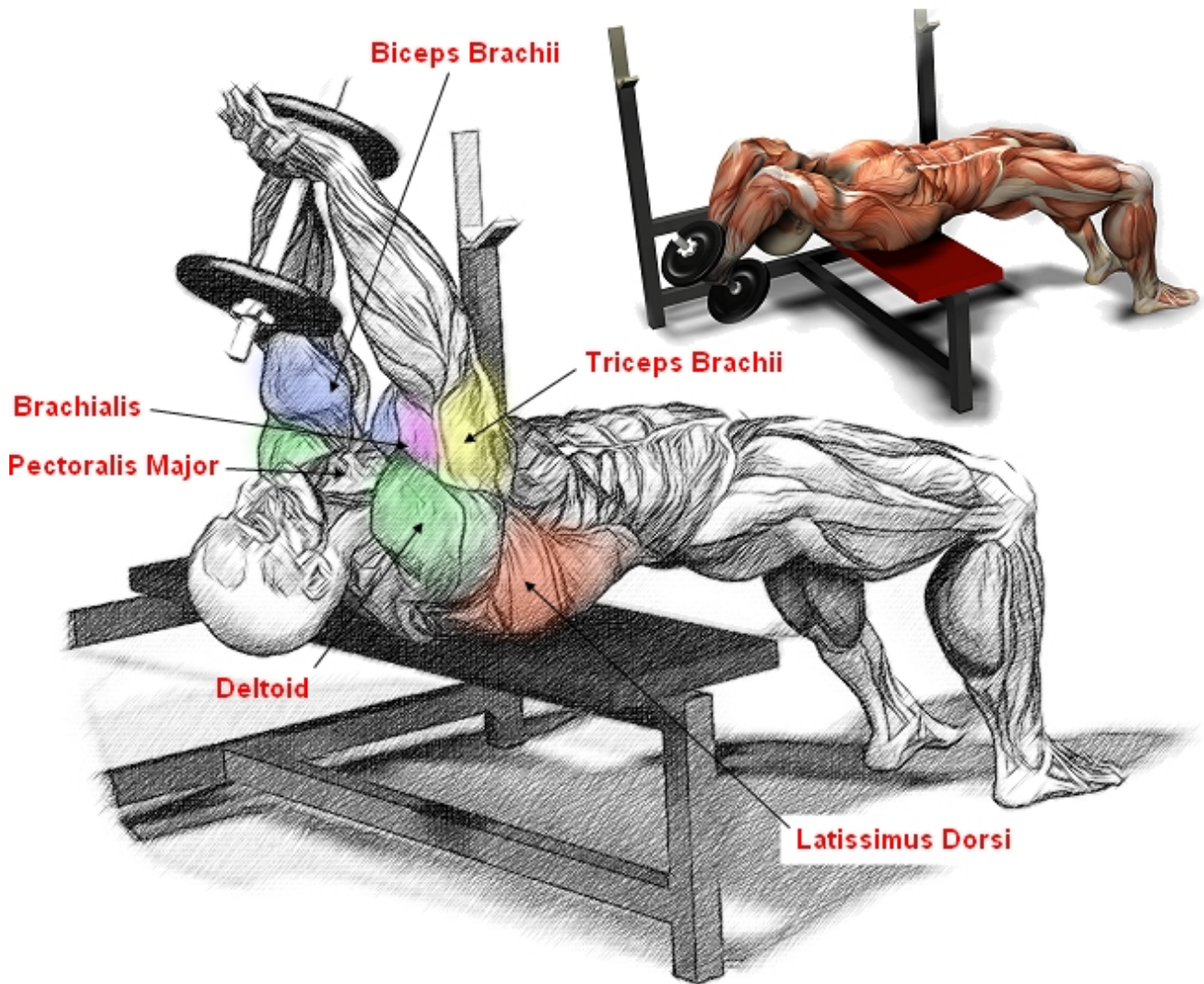
10 reps with 4 breaths between

5 reps with 5 breaths between

This makes it 25 reps per set – repeat for up to 3 sets.



# Dumbbell Pullover Anatomy



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Breathing pullovers are performed immediately following the squats while you are still breathing strongly.

This can be done with two dumbbells, a barbell or a single dumbbell. Its best to do it straddled over a bench, with the edge of the bench along the bottom of the diaphragm so long

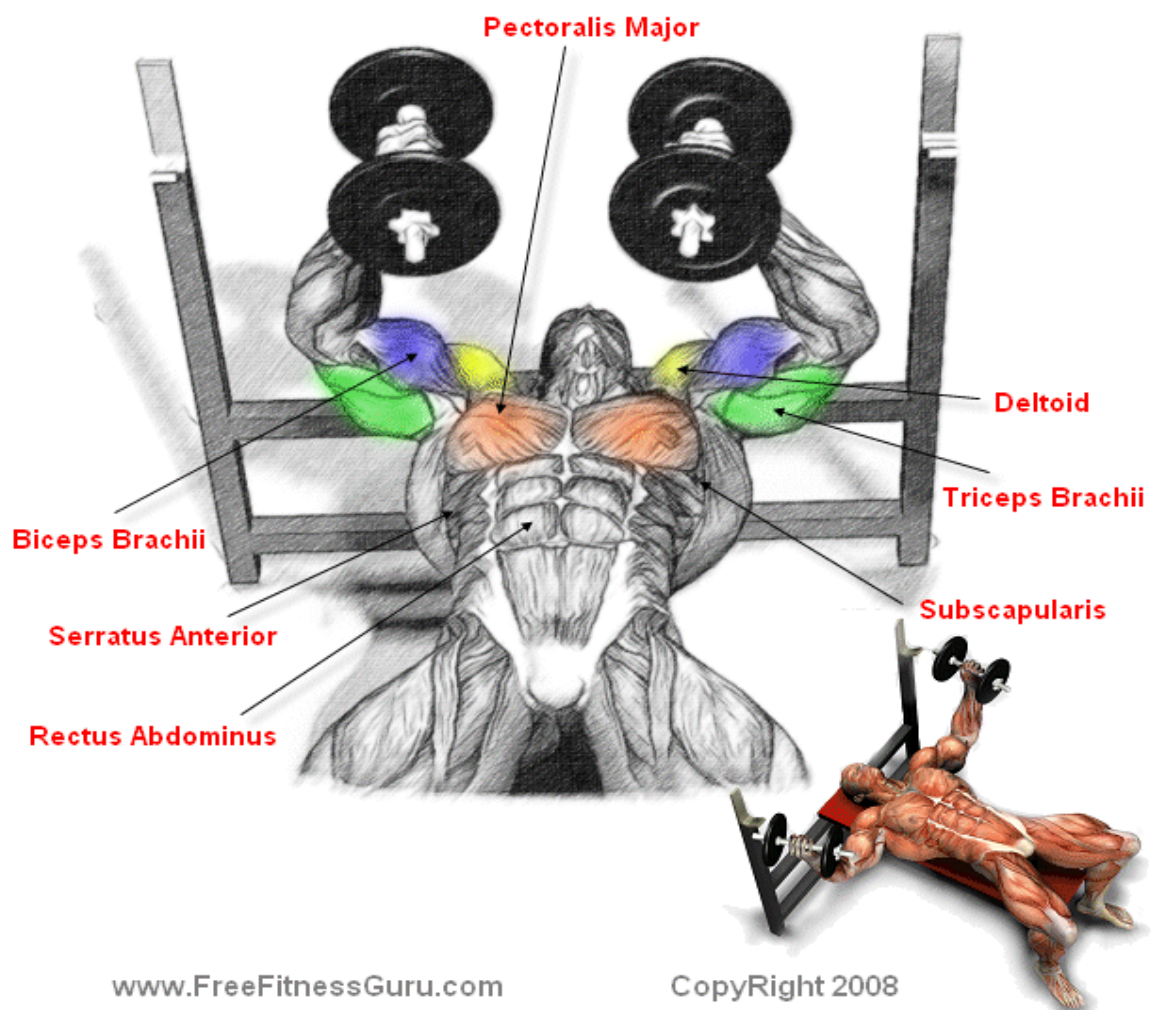
as this is comfortable and with the back arched.

This is to be done with a light weight. Take two deep breaths and lower the weight while forcing more air into the lungs.

Exhale the air as the weight is raised. 20 reps can be performed with this exercise also.

For many people this will be sufficient training but if you wish you can add the other exercises that follow.

## Dumbbell Fly Anatomy



This exercise should be performed in the same style as the pullovers, with a light weight, two deep breaths then lower the weight while forcing more air into the lungs. Exhale as the weight is raised and perform 20 sets.

## **Rader Chest Raise**

This is a new exercise for me and I only discovered it while researching this report. This exercise is difficult to describe.

You need a pole or mantle in front of you and reach out to this about six inches above head height. Hands three inches or less apart. Pull downward and inward as you breath inward to your maximum capacity and lift your rib cage. This exercise is perfomed isometrically.

Two yoga exercises that can help expand the rib cage are the cobra pose and the stomach vacuum.

When you look at the positioning in the cobra on the stomach with upper torso raised and stretched it is similar to the pullover. Deep breathing should be applied.

Stomach vacuum will assist in controlling and developing the respiratory muscles. We will discuss more about yoga breathing later.

## **Lung Capacity Training**

Lung capacity is simply the volume of gas that your lungs can inhale, hold and exhale. Lung capacity is a function of the size and anatomy of your thorax which we addressed in the previous section and in the development of the musculature that is involved with breathing.

As we have already discussed methods for enlarging the thorax lets discuss some exercises for improving lung capacity in other ways.

### **Wind Sprints and Hill sprints**

These sprints are performed in short bursts of 100 meters or less. Basically you want to go all out at full speed. Rest briefly and then repeat.

## **Fartlek**

Similar to a wind sprint but instead of resting in between you continue to run at a reduced pace.

## **Swimming Sprints**

The same principle as above can be applied while swimming. A fartlek or short sprint can be performed surface or underwater swimming. A good set of fins can greatly assist with swimming sprints.

## **Play The BagPipes !!!**

I know most people dont want to play the bagpipes or any other musical instrument but doing so can positively affect lung capacity as can singing or just plain yelling your lungs out like they made us do in the infantry core. Trombone, saxophone etc all do the same thing for your lungs.

I'm not really being serious – but some people will find this an acceptable avenue to explore.

## Blowing stuff up !!!

Another amusing method for increasing lung capacity is blowing up balloons – there are people that can burst hot water bottles through persistent training of the respiratory muscles. Clearly there is the potential danger of a burst blood vessel in the lungs. I don't recommend you go try bursting hot water bottles but I do recommend you strengthen your respiratory musculature.

A convenient alternative is the “expand-a-lung” device which is available online. This is a small variable resistance valve that you can use while running, cycling etc. They cost \$29.95 and the website calls it an inspiratory / expiratory breathing resistance exerciser.



## **Yoga**

Many of the yoga exercises employ breath holding and fine neural control of the respiratory muscles. It is pointless to go over these in this report as there are so many good books on the subject. Take a look at the books “light on yoga” and “light on pranayama” for detailed and practical exercises you can adapt for lung capacity training.

## **Free Diving**

Free divers are the experts on lung capacity and breath holding. This is a dangerous sport and it involves diving in an inverted posture with the head pointed downward to a maximum possible depth. There is a bizarre neurological response to the pressure of the water and the upside down position that causes the body to drastically slow the heart rate. This in turn allows the diver to hold their breath even longer. Free divers use all the tricks we are discussing in this report, many also use meditation and biofeedback to gain control of the nervous system and overcome the gagging reflex that could spell panic death at depth.

## **Lung Capacity Summary**

All forms of cardio training can positively affect lung capacity, playing a wind instrument or singing, use of breathing resistance devices, exercising underwater and yoga style breathing exercises like pranayama are effective also.

## **Increasing VO<sub>2</sub>max**

Most of the exercises so far will contribute to increased VO<sub>2</sub>max. One aspect we have not yet discussed is hypoxic training. Hypoxic training is most often associated with altitude training. Research has shown high altitude training to be effective in increasing performance at high altitude but not at sea level. This is because at high altitude the hypoxia is continuous 24/7 and this has adverse physiological affects. I do not advocate high altitude training to induce hypoxia. I am an advocate of short duration, low altitude hypoxic training.



Such training if performed correctly is of too shorter duration to have the adverse affects of high altitude training but is still sufficient to elicit an adpative response from the respiratory and vascular systems.

An example of this is carotid artery dilation. The Carotid Artery (jugular) dilates in response to elevated blood CO<sub>2</sub>.

If brief periods of CO<sub>2</sub> elevation are induced through breath holding or bag breathing – eventually there will be a permanent increase in the diameter of the blood vessel. This is known as Carotid masking.

Hypoxic training employed in this way – for short, safe durations induces an adaptive physiological response.

Hypoxic swim sprints and underwater swimming are great ways to do this kind of conditioning. Pranayama breathing exercises also induce the hypoxic response.

Always perform these exercises with caution. Do not do

hypoxic swimming unsupervised and do not perform hypoxia to the point of dizziness or faintness. There are various supplements that can aid capillaries to repair and dilate such as vitamin C and E, Nitro Oxide, garlic and ginkgo biloba. You may want to try some of these along with your training regimen.

Thats it for this report – I hope you find it helpful

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