



NEW ZEALAND
FIRE
SERVICE
Whakarātonga Iwi

FireFit

*Firefighters' guide to
preparing for the physical
competency assessment*



Name:

A bit of an overview

First of all congratulations!

Taking the first step to participate in a training programme can be a bit daunting, but with a little motivation and perseverance you will see that not only is training beneficial, it is also a lot of fun.

This training diary is designed to provide you with some basic training information including the two generic conditioning programmes you have seen on the Physical Competency Assessment (PCA) video. We have also included some nutritional tips and log sheets to help you along the way.

But do remember that this is not intended to be a stand-alone resource. It should be used in conjunction with the PCA video.

It is important to keep in mind that these are generic programmes, so they will not suit everybody's individual needs or preferences. We recommend you gain medical clearance before participating if you have any specific injuries or conditions.

Who are we?

We have both completed Physical Education Honours degrees at the University of Otago, are involved in teaching at the School of Physical Education and are self-employed exercise professionals. We sincerely hope you find this training resource to be user friendly and of some benefit to you – if you have any queries, comments or need some extra help along the way, please feel free to contact us at the addresses below.

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The programmes

General conditioning

The aim of this programme is to give you an introduction to gym-based training techniques and to help you develop a base level of physical conditioning on which to build in the future. It is essential to gain a general conditioning base before moving on to more specific/complex training – you need to teach your body the basics first. If you advance too early you may end up overloading incorrect movement patterns and muscle groups, increasing your risk for injury, which is not an optimal result.



Specific conditioning

This programme is designed to be a progression from the general conditioning programme. The aim is to build on the base that you have developed, while incorporating exercises and movement patterns that are more specific to the demands that you face as a firefighter.



How long should I use each programme?

Because everyone is going to be at different levels with their training, it is difficult to state exactly how long you should use each programme. In general, you should aim to stick with a training programme for at least 8 weeks to enable your body to make improvements. Programme durations longer than 12 weeks may be sub-optimal if you are a regular exerciser. This is because your body becomes accustomed to what it is doing and as a consequence you are less likely to make any further gains. For this reason it may be beneficial to change your training every couple of months or so to keep your body guessing and to remain challenged.

What about training frequency?

In order to make improvements you should really try to work out a minimum of 3 times per week. You can of course train more frequently if you wish, however it is not advised to repeat the same resistance training session on two consecutive days – your body needs recovery time in order to make gains so place a rest day in between each training day, for example work out every second day. Although this won't suit everyone's individual training needs, experience or preferences, it is essential to have a rest day or two each week for recovery. Keep in mind that the physical aspects of your job are also a form of training – learn to listen to your body and rest when you need to rest.



Some basic definitions

What is training?

So what do we really mean by training? Two basic areas of training are covered in this resource: cardiovascular training - which is what most people would think of when we talk about fitness or stamina; and resistance training – which aims to improve strength and muscle function. Cardiovascular training involves activities that get the heart pumping such as running, cycling and skipping, whereas resistance training involves lifting, pulling or pushing weight or performing body weight movements. Obviously both strength and cardiovascular fitness are important for the physical demands of firefighting.

Progressive overload:

How to personalise your training

No matter what type of training you are performing, challenging yourself is very important. In order for your body to make improvements it needs to be overloaded. That is, you need to push your body beyond the level that it is comfortable working at. However, it is essential that you overload your body gradually to prevent injury and to gain optimal results. For example, if you can currently complete 10 mins on the rowing machine at a pace of around 2:50mins/500m, then in order to overload you body you could either increase the duration of the exercise (say to 12 mins) and keep the pace the same, or you could increase the pace (say to 2:40mins/500m) but keep the duration the same. In terms of resistance training, if for example in your bench press you could easily complete 12 repetitions with 5kg dumbbells, then you could either increase the number of repetitions (say to 15) with the same weight, or you could increase the weight (say to 7kg dumbbells) and keep the repetitions the same. Either way you have increased the amount of work your body has to do, which keeps you challenged.

Cardiovascular training

How to measure intensity?

One of the common ways to measure intensity with cardiovascular training is using heart rate measurements. However, a number of factors can influence heart rate (such as age and fitness level), and so it becomes difficult to accurately prescribe a specific heart rate range that will suit everyone without knowing your background. Therefore a simple, yet effective, way for you to measure how hard you are working during your cardiovascular training is to use the RPE (rating of perceived exertion) scale*. This scale allows you to decide for yourself how hard you are working and to adjust the intensity accordingly. It is important to remember that the scale is a measure of how hard the exercise load is feeling, rather than just how you are feeling at the time.

Ratings of perceived exertion (RPE)*

0	Nothing at all
0.5	Very, very weak
1	Very weak
2	Weak
3	Moderate
4	Somewhat strong
5	Strong
6	
7	Very strong
8	
9	
10	Very, very strong

* Source: Noble, B., Borg, G.A.V., Jacobs, I., Ceci, R., Kaiser, P. (1983). *Medicine and Science in Sports and Exercise*. 15: 523-528.

Resistance training

Rep – a repetition refers to one complete movement of an exercise, usually comprising a lifting and a lowering phase.

Set – a set refers to a group of repetitions completed continuously without resting.

Rest period – this is the duration of the recovery intervals between sets.

Load – because of the large variation in individual strength levels, it is important to choose a load that is appropriate for you and not just what everyone else is lifting. For example, for the general conditioning programme, most of the repetitions have been set at 12-15, therefore you want to select a load that you can safely lift for 12-15 repetitions, but would be too heavy to lift for 18-20 repetitions (remembering that you don't want the load to be too easy or you won't be providing your muscles with enough of an overload to make improvements).

BB – barbell

DB – dumbbell

Tempo – this refers to how fast you perform each repetition. For example, the general conditioning programme specifies the tempo to be 'slow'. This would equate to a ratio of around 2:1:2 – a 2 second lifting phase, followed by a 1 second pause at the midpoint, then a 2 second lowering phase. Controlling the movement is key and don't forget to breathe. Breathe out during the lifting or work phase, breathe in during the lowering phase.

Nutrition – food for thought

Nutrition impacts on your health and your ability to physically and mentally perform. As a firefighter, you need to ensure that high-energy nutritious foods and fluids are consumed regularly to meet the demands of work and training. A balanced diet is important – meeting baseline nutritional requirements will provide a foundation for healthy eating. Follow the guidelines* below to make sure you are getting the nutrients your body needs.

<i>Food Group</i>	<i>Number of Serves – at least:</i>	<i>Example Serve Size</i>
<i>Breads & Cereals</i>	<i>6 serves</i>	<i>1 cup cooked rice or pasta, a roll, 1 cup breakfast cereal, 2 plain biscuits</i>
<i>Fruit & Veges</i>	<i>2 serves of fruit 3 serves of veges</i>	<i>medium size fruit or vege, 1 cup fruit juice, ½ cup cooked vege or stewed fruit</i>
<i>Milk, Milk products & substitutes</i>	<i>2 serves</i>	<i>1 glass of milk, 1 pottle of yoghurt, 2 slices of cheese</i>
<i>Lean Meats, Poultry, Fish, Eggs, Nuts & Pulses</i>	<i>1 serve</i>	<i>2 slices cooked meat, ¾ cup casserole, 1 medium fish fillet, 1 egg, 1 chicken leg</i>
<i>Fluids</i>	<i>8 cups</i>	<i>Water is preferential, keep coffee intake to minimum</i>

- Prepare meals with minimal added fat and salt
- Choose pre-prepared foods, drinks and snacks that are low in fat and salt
- Eat a variety of foods from each of the four major food groups each day (see above)
- If drinking alcohol do so in moderation

* Source: Howe, M., Helleman, I., Rehrer, N. & Pearce, J. (1999). Sports Nutrition for New Zealand Athletes and Coaches. Wellington: Sport Science New Zealand Inc.

Hydration and nutrition for training

In addition to the foundations of healthy eating, fuel and fluid for training and other physical activities require special consideration. With training you need to ensure that you have had something to eat at least 2 hours prior to exercise and keep hydrated with water. It is important not to rely solely on thirst to know when to drink - by the time you are thirsty your body is already slightly dehydrated. Make sure you take on water during and after your workout and replace energy stores with a good nutritious meal within 2 hours. Keep your energy levels up for training and for the demands of firefighting by eating small, frequent meals and remember food is fuel – a balanced diet will provide all the nutrients and energy you need to be active.



General conditioning programme

Warm-up:

5-10 mins of cardio activity (eg. rower/Bike) – RPE 3-4
Dynamic stretches (holding 2-3 secs each)

Strength training:

Exercise	Sets	Reps	Rest
Squats (body weight/smith machine)	2	12-15	30 secs
BB bench press	2	12-15	30 secs
Static lunges	2	10-12 each leg	30 secs
Lat pulldown (single arm)	2	12-15	30 secs
DB shoulder press	2	12-15	30 secs
TVA* squeeze	2	5 x 5-10 sec holds	30 secs
Seated woodchop (on SB)	2	10-12 each side	30 secs
Prone cobra	2	12-15	30 secs

Cardiovascular training:

- Duration: 15-20 mins
- Mode: continuous cardio activity (e.g. rower/bike/skipping etc)
- Intensity RPE 4-5

Cool-down:

3-4 mins light cardio activity (RPE 2-3)
Static stretches (holding 20-30 secs each) – see ACC posters (pp 22-23)

* TVA = transverse abdominus (lower abdominal muscle)

Exercise techniques & key points for a general conditioning programme

Dynamic stretches:

- Hold each stretch for 2-3 seconds max



Body weight squat:



oints: mme

Smith machine squat:

- Lead with butt back—'sit on seat'
- Keep shoulders back and chest out
- Weight through heels



BB bench press:

- Bring bar down to mid-line of chest and push up



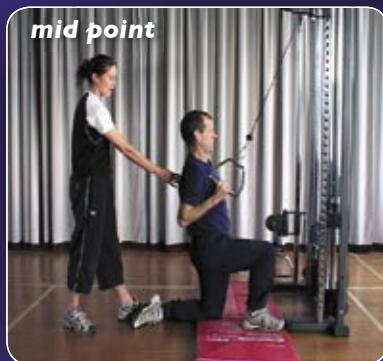
Static lunge:

- Drop hips straight down while bending at knees – ensure front knee doesn't move past toe
- Weight through front heel rather than front toes or knee



Single arm lat pulldown:

- Slight lean backwards, keeping abdominals tight
- Keep elbow close to body



DB shoulder press:

- Keep abdominals tight



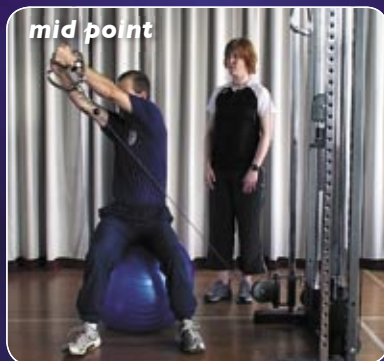
TVA squeeze:

- Place 2 fingertips under curve in lower back and draw navel in towards spine
- Feel light pressure on fingertips throughout the squeeze
- Only light contraction – you should still be able to breathe and talk easily



Seated woodchop (SB):

- Keep both arms straight throughout movement
- Focus on rotating shoulders



Prone cobra:

- Ensure head and neck are kept in neutral alignment



Specific conditioning programme

Warm-up

5-10 mins of cardio activity (eg. rower/bike) – RPE 3-4

Dynamic stretches (holding 2-3 secs each)

Exercise	Sets	Reps	Rest
BB step ups	2	12-15 each leg	30-60 secs
Standing cable row (single arm)	3	8-10 each arm	60-90 secs
DB bench press (on SB)	2	8-10	60-90 secs
Cardio (e.g. bike/rower/skipping)	4-5 mins : 'Hard' – RPE 5-6		
Squats (with DB pick-up)	3	15-20	30-60 secs
BB upright row	2	8-10	60-90 secs
Prone hold	2	30-60 secs	30 secs
Cardio (e.g. bike/rower/skipping)	4-5 mins : 'Hard' – RPE 5-6		
Lunges (forward and backward)	2	10 each leg	60-90 secs
Standing cable woodchop	2	10 each side	30 secs
Prone hip extension (on SB)	2	10-12	30 secs

Optional extra exercises:

Exercise	Sets	Reps	Rest
Cardio (e.g. bike/rower/skipping)	4-5 mins : 'Hard' – RPE 5-6		
DB biceps curl	1-2	8-10	1 min
Triceps dips (off bench)	1-2	8-10	1 min

Cool-down:

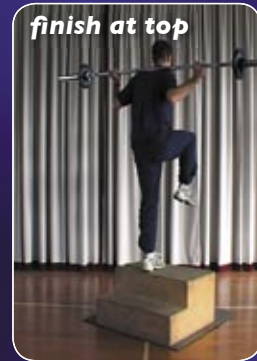
3-4 mins light cardio activity – RPE 2-3

Static stretches (holding 20-30 secs each) – see ACC posters (pp 22-23)

Exercise techniques & key points for a specific conditioning program

BB step ups:

- Try to place whole foot on step
- Make sure you control both the upward and downward parts of the movement



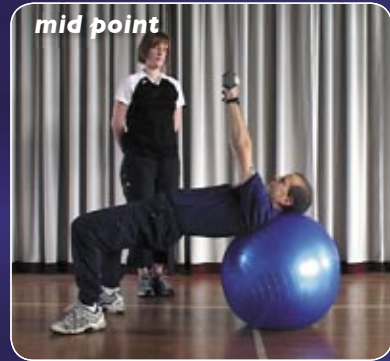
Single arm standing cable row:

- Maintain correct posture – keep abdominals tight
- Keep elbows close to body



DB bench press (SB):

- Ensure head and shoulders are supported by the SB
- Keep hips up throughout the movement



Squat with DB pick up:

- Lead with butt back - 'sit on seat'
- Weight through heels
- Keep shoulders back and chest out throughout movement



BB upright row:

- Bring bar up to chest level
- Keep elbows higher than hand position



Prone hold:

- Tilt hips under – ensuring hips are slightly higher than shoulders
- Keep abdominals tight without arching or rounding back



Lunges (forward/backward):

- Drop hips downward while bending at knees – ensure front knee doesn't move forward past toe
- Keep abdominals tight throughout movement



Standing cable woodchop:

- Keep arms straight throughout movement
- Focus on rotating shoulders rather than hips



Prone hip extension (SB):

- Keep head and neck in neutral alignment
- Turn thumbs up towards roof



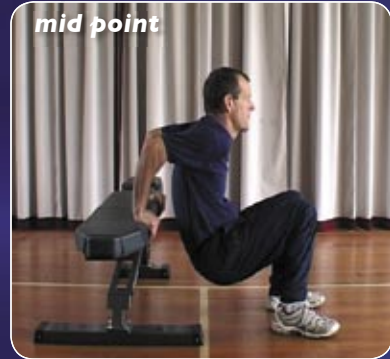
****DB biceps curl:**

- Keep elbows locked into your side



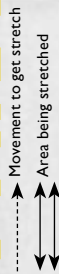
****Triceps dips (bench):**

- Hands facing forwards
- Keep elbows pointing backwards rather than out to side



** these are the additional optional exercises

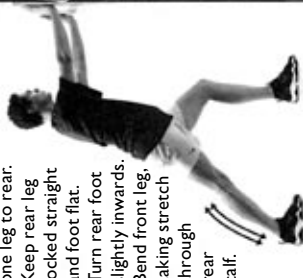
STRETCHING EXERCISES



LONG CALF MUSCLE

Place hands on wall, with one leg to rear.

Keep rear leg locked straight and foot flat. Turn rear foot slightly inwards. Bend front leg, taking stretch through rear calf.



SHORT CALF MUSCLE

Place hands on wall taking weight through rear leg. Turn rear foot slightly inwards and keep the heel flat. Bend rear knee forward over rear foot.



Place foot on a raised surface. Stand with supporting foot turned slightly inwards. Bend supporting knee. Keep back straight.

HAMSTRINGS



FRONT THIGH

Pull heel towards buttock. Keep back straight, knees together, and in line.



PECTORALS

Stand side-on to a wall or pole with closest leg forward. Place forearm on wall with shoulder slightly above 90°. Turn upper body away from wall or pole.



TRUNK SIDE FLEXORS

Stand with feet comfortably apart. Fold arms above head. Bend to the side slowly. Stretch up with upper elbow.



Kneel on ground with front knee at 90°. With the back straight, tilt the pelvis back by tucking the abdomen up and in and squeezing buttocks. Keep head up.

HIP FLEXOR



TRICEPS STRETCH

Place hand between shoulder blades. Place opposite hand on elbow. Pull elbow towards midline with help from opposite hand.



SHOULDER CHEST

Stand with head up, chin in, hands clasped behind back. Pull shoulders down and back. Press shoulder blades together and stomach in to prevent arching of the lower back.



LOWER BACK

Lie with hands behind head, arms flat. Bend hips and knees to 90°, feet together. Roll knees over to ground. Upper knee should be directly above lower knee.



GROIN



Sit on floor with back straight. Grasp the ankles and draw them towards groin. Use the elbows to apply a gradual downward and outward pressure on the knees.

BUTTOCK

Gluteals – Lie on back with both hands around one knee. Pull knee towards opposite shoulder. Keep head, shoulder and opposite leg relaxed.



Piriformis – Lie on back and hold knee to chest. Pull knee and ankle towards opposite shoulder.

THE KEYS TO EFFECTIVE STATIC STRETCHING 1. Do some light aerobic exercise before starting stretching. 2. Breathe normally. 3. Apply each stretch slowly – take it to where tension can be felt, but not pain. 4. Hold each stretch for at least 30 seconds. 5. Don't bounce up and down while stretching. 6. Stretch all major muscles, especially those that will have a large demand placed on them.

WARM-UP

Warming-up prepares the body for physical activity – it prevents a rapid increase in blood pressure, improves blood flow to the heart, increases muscle temperature and makes muscles more pliable.

Your warm-up should include:

1. Aerobic exercise – continuously for 5-10 minutes to raise body temperature
2. Stretching – stretch all major muscles groups used when playing sport
3. Sport-specific exercises – do the sorts of exercises frequently used in your sport.

COOL-DOWN & STRETCH

Cooling-down and stretching after playing sport may reduce the risk of injuries happening. It also helps to promote flexibility.

This low intensity exercise should last 5-15 minutes and include activity such as slow jogging and stretching.

Your cool-down should include:

1. Aerobic exercise – slow jogging is one of the best ways to cool-down
2. Stretching – static stretch for 10 minutes after light jogging
3. Recovery – after any exercise, make sure you rehydrate.

www.acc.co.nz/sportsmart

Stretching exercises supplied courtesy of ACC.

Log Sheets

The following pages contain log sheets to help you keep track of your training. These are great for helping you remember where you were at during the last session, to make sure you challenge yourself and also to monitor improvements as the weeks go by.

Below is an example log sheet that we have filled in to give you an idea of how to record your training.

	Date 7/6/03			Date		
Cardiovascular Training	Row	Bike	Box			
Mode	5min	10min	5min			
Duration	8	4-6	-			
Level	2:25	90rpm	-			
Speed	4	5	5-6			
Intensity (RPE)	1	2	3	1	2	3
Resistance Training	15	15	-			
Body weight squat	15 x 40	13 x 40	-			
BB Bench Press	12	12	-			
Static Lunges	15 x 45	15 x 45	-			
Lat Pulldown	15 x 12	13 x 12	-			
DB Shoulder Press	5	5	-			
TVA Squeeze	10 x 10	10 x 10	-			
Seated Woodchop (SB)	15	15	-			
Prone Cobra						
NB: (reps x load)						

