## Step 4 – individual sessions: aerobic base work

In step 3, we looked at how to fit sessions into any given week. Now, we need to schedule what happens within an individual session. We start with the simple modality – aerobic work. Controlling the intensity of this work is done using heart rate. As a result, we need to know the athlete’s maximum heart rate, so we can set up some training zones. There’s 2 ways of establishing this: measure it, or estimate it.

Measuring it: any of your athletes that have a heart rate monitor: put it on and play a game of hockey (I don’t recommend this if the watch is all you have, but a chest-strap is pretty non-invasive, and saves the watch [the expensive bit] from getting broken). At the end of the game, your athlete is going to have a decent look at very high heart rates – it’s just hard to play a competitive game and not get into a max or very near max situation. Over several bouts, you’ll see similar high values emerge – for example, a game of ice hockey for me will reliably top out in the high 170’s - 177 is my most recent. Add a couple of beats to account for the fact that I might not have truly maxed out, and I can confidently say that 180 is a number pretty close to my max. I’ve not seen any value above that for over 2 years, and I reliably see values in the 170’s.

Estimating it: take age and multiply by 0.7. Then subtract that from 208. Estimated HR max solved. Example: I’m 51 years old. 0.7\*51=35. 208-35=173. My age estimated HR max is 173. Not that this is an estimate and it will vary from measured values by 10 beats or more – that’s OK, we need to get close, not precise here.

Ok, now that we have a max value, we create zones of effort from zone 1 (51-60% of max), zone 2 (61-70%), zone 3 (71-80%), zone 4(81-90%, to zone 5 (91-100% max HR). Using my measured and estimated HR values, my zones would look like the below.

|  |  |  |
| --- | --- | --- |
| Zone | Measured max (~180) | Estimated max (~173) |
| Z1 | 90-108 | 87-104 |
| Z2 | 109-126 | 105-121 |
| Z3 | 127-144 | 122-138 |
| Z4 | 145-162 | 139-156 |
| Z5 | 163-180 | 157-173 |

As you can see, it makes a difference which one you use, but it doesn’t make a HUGE difference. Estimated is certainly ‘good enough’ if that’s all you have.

Now for the actual programming. For the first months (block 1 through Block 5), where we are interested in building an aerobic base, this is really simple. Having picked a modality (walk/run, row, cycle, etc), we work in ZONE 2 – up towards the top half of the zone. The objective is to work at that pace for 1 hour. In Block 1, we work up to that - we have 8 workouts in block 1, so it would look like this:



This athlete would then be able to start Block 2 (the second month) at 1 hour. We stabilise at 1 hour - it’s long enough to give us the adaptation we’re after, and more duration, whilst it might bring more benefit, takes more time out of life and exposes us to a higher risk of overuse injury.

If you have guys already doing this kind of work, for this kind of duration (i.e., about an hour), they can start in block 1 at that target duration – no need to work them up if they are already there.

Now, Zone 2 work is deliberately slow and will feel pretty easy. The benefits won’t appear for a couple of months. What we will see is that your athletes will start to cover more distance at that same heart rate. What we’re doing is expanding the range of what’s easy – whereas rowing, say, 10km at an easy pace might be where you start, you’ll soon find yourself rowing 11.5 km at the same HR .Same with cycling/running/etc. Runners may find that they have to use a brisk walk to stay within the zone. That’s OK.

## Step 5 – Individual Strength workouts

This is the tricky bit. I’m going to make some recommendations here, but it’s hard from this distance to actually run a program. We are going to talk about 3 groups of athletes: Group 1, who are already doing strength training, group 2, who are not training but have access to a strength training facility (a gym), and group 3, who are not training and don’t have access to a strength training facility.

Recommendations for group 1: If you’re happy with what you are doing, keep doing it. If you want a change, move your workout towards that maximal strength end of the spectrum: each exercise at 3 set, 5 reps each, heavy loads – 85+% of your max. Squats, deadlifts (1 set of 5 for these to ensure we don’t fatigue the back and hurt ourselves), bench press, overhead press. Chinups – weighted if possible, or unweighted for 15-20 rep sets. Cut out all the single joint stuff and go big and basic.

Recommendations for group 2:

OK, first thing. We are using these exercises to develop Strength. Strength is the ability to exert force. More strength = more force. Obviously, that’s useful – it means you can lift and carry heavier stuff, and/or push/pull objects out of the way (people, even, if we’re playing competitive contact sports). Strength is THE fundamental fitness adaptation. Every other adaptation you can think of benefits from the presence of more strength. Strength does not reciprocally benefit from elevations in all other adaptations. Example – endurance athletes use submaximal contractions to propel them through space (i.e. distance running). Not all fibres are used all the time (i.e. submaximal effort – if it were a max effort, all fibres would fire simultaneously to generate max force). So, with some fibres on and others off, what happens is that the muscle cycles through fibres to give them a break – they have an on-off cycle called the duty cycle. If the muscle is stronger, each contraction is a lower percentage of the overall strength of the fibre. Thus, the fibre can be used for longer before fatiguing. Thus, the ‘Off’ fibres can be ‘off’ for longer – getting more rest and thus being more capable of sustaining long term submaximal contraction (fuel substrates permitting). The obverse example (making fibres more capable of sustaining very submaximal efforts) does not, due to the very submaximal nature of the effort, increase the maximal strength capacity of the fibre. So, absolute strength increases CAN benefit endurance performance, but absolute endurance increases cannot benefit absolute strength performance (acutely). So, I’m a fan of strength. I can go all day with these examples – agility, coordination, power, it’s all the same. Strength underpins all of them. It is the foundation. Most people try to get fit without getting strong. This is the key and most basic error of all fitness training. We will not make this error.

Next thing. We can get stronger using almost any exercise. The second most fundamental error in fitness training is to choose the ‘inefficient’ exercises. Example – go into almost any commercial any gym, anywhere and you will find young males doing bicep curls. This is an atrocious exercise choice for us insofar as it is inefficient with regard to whole body strength. Unless you’re interested in a bicep curl challenge, there are many, many ‘better’ exercises – exercises that, for the same amount of time and effort, train more muscle mass. Also, in sports and life, we rarely call one muscle group into play at a time – most efforts are the synergy of multiple muscle groups. Certainly, most sporting actions are – jumping to take a mark uses the entire posterior chain from the calves, through the quads, glutes, back extensors and shoulder flexors. That’s what we are after here – exercise choices that call into play a larger proportion of your muscle mass, and cause you to move in a functional, real-world fashion. Thus my choice of exercises for the strength element of this program.

Next thing – the thing we vary when we train basic strength is INTENSITY. Not exercise choice. Common fitness error – constantly changing the basic exercises done for strength. We’re going to do these exercises constantly over the 9 months and we’re going to slowly increase the INTENSITY – the load that you lift. We’re always looking to increase the load on the bar. Early on, it’ll change quickly – you’ll make rapid early progress. After that, it slows to a crawl – but it does increase with constant stimuli. I’ll talk about loading in each of the exercises, in the exercise execution section.

OK, last general point – possibly the most important of all. Safety. The high load nature of these exercises exposes you to risk – risk of injury. That risk is ameliorated by 2 things – good technique, and not being an idiot in the gym. Good technique needs coaching, so get a mate to film you doing this stuff periodically, and review against the execution instructions. Even better, get a PT to teach you these exercises, if you’re doing them for the first time. Not being an idiot essentially means using the safety features of the gym (and the power rack, particularly) well and ALWAYS. We’ll talk safety in each of the exercises.

OK, so we have 2 days per week scheduled. They look like this:



\*Chinup: if capable, begin at sets of 10, working up to sets of 15. When capable of 3 sets of 15, begin adding weight with weight vest and progress as per other exercises. If not capable of 3x sets of 10, do 3 sets to 1 rep before failure, and try to expand the number of reps towards 3x15.

The ‘work’ sets prescribed are typically in the format 3 sets of 5 reps. There are exceptions to this, specifically deadlift, which is 1 set of 5 reps, and chinup, which will vary by initial capacity. But all the others call for 3 sets of 5 reps. However, prior to the ‘work’ sets, you need to do specific ‘warmup’ sets, which are left (to the main part) to your discretion (your choice is ‘how much’ warmup to do, not ‘do it or not’). All Bar loaded exercises (so, not chinup, but everything else) begins with the empty bar (20kg), moved for 10 reps. We then typically do 5 reps of 50% of the work set load, then 2-3 reps of 75% of the work set load. We might then choose to do 1-2 reps at 90% of the work set load. Then we start with the work sets (3x5). So, if you were doing Squat at 50kg (really light), you’d do the following warmup:

Bar (20kg) x 10 reps

50% (25kg) x 5 reps

75% (37.5kg) x 2-3 reps

90% (45kg) x 1-2 reps

Then 3 sets of 5 reps at 50kg

Rest periods within the warmup are short – literally, however long it takes you to load up to the next weight and setup. Rest periods between work sets are typically 2-3 minutes – not shorter than 2 min. put a clock on this if necessary.

Exercise execution:

**Squat**

Step 1. Find the squat rack. Adjust the hooks inside the rack so that the bar rests at about mid chest height.

Step 2. Without the bar, squat down to check how low your shoulders get. Then set the catch bars up at just below this height.

Step 3. Now the rack is setup for you to squat. Take you SHOES OFF. Approach the bar. Duck under it, and place the bar ACROSS YOUR BACK (NOT on the base of your neck or on your shoulders) – see this image:



Like the right image – across the spine of your scapula – not like the left image – base of the neck.

Step 4. Put your hands on the bar as close to shoulder width as you can – shoulder flexibility will determine how wide you go.

Step 5. Push your elbows backwards – this will bring your hands forwards and compress the bar into your upper back – this is what holds it in place.

Step 6. Stand up, taking the bar out of the rack.

Step 7. Take 1-1.5 steps backwards.

Step 8. Take up a stance with your feet hip width apart and your toes pointed out at about 30 degrees.

Step 9. Begin squatting by pushing the hips backwards and down. Do not attempt to hold the back upright (like the goblet squat) but focus on keeping it rigid and unbent. Aim for the top of the thigh to reach parallel to the floor. Then stand up, and repeat x10. This is your warmup set done. See images below for positioning:

Here’s some video to check out to see the moving parts, as they move:

<https://www.youtube.com/watch?v=ultWZbUMPL8>

<https://www.youtube.com/watch?v=nhoikoUEI8U>

Note the following – knees track out over the toes – i.e. they don’t collapse inwards, but they don’t end up way forwards of the toes. The back angle relative to the floor will be slightly lower than the tibia (lower leg) angle relative to the floor. The neck is part of the spine and does not act independently – the whole spine (neck included) acts as one rigid unit – so we don’t look up or down, we look where the back angle takes us.

For your first squat workout, do a warmup with the bar, then load up to 40kg and do 3x5. That’s it. IF this is easy, the next squat workout adds 5kg. Keep adding 5 kg until that’s too much to add. Then start adding 2.5kg. When that’s too much, find the change plates in the gym and start adding 1kg increments.

Final note – ALWAYS take the bar out of the rack and step backwards when setting up. This means that when you are trying to rack the bar after a set, you have to step forwards to do it. This is much easier when fatigued than racking the bar backwards. ALWAYS unrack the bar and step back. ALWAYS rack the bar by stepping forward. ALWAYS. EVERY.SINGLE.TIME.

**Deadlift**

Step 1. Out on the lifting platform, add 20kg to the bar (10kg each side). This is your warmup load.

Step 2. TAKE YOUR SHOES OFF.

Step 3. Move forward until your feet are under the bar. You should be able to look down and see the bar across your midfoot – just a little bit more towards the toes than where your shoelaces would be tied.

Step 3. Bend over and grab the bar (DON’T MOVE IT BACK AND FORTH) with a double overhand grip-palms facing backwards. Your back will be rounded at this point, that’s OK, we fix that in a minute.

Step 4. Push your knees forward until your shins touch the bar.

Step 5. Think ‘Chest-up’. Try to bring your chest up so that your back is now a rigid, straight line. See the image below:

Step 6. Stand up with the bar in your hands. At the top, DON’T lean back. Just stand tall. Then, reverse the process to put the bar down – or, if it’s really heavy, just drop it. 10 reps.

Step 7. Add 20kg more to the bar and do 5 reps at 60kg. That’s it for your first deadlift session. When you come back for the next one, add load (usually +5-10kgfor the first couple of sessions). Follow the process for squat (+10 until that’s too big a jump, then +5, then + 2.5 – then =1kg , just like squat.).

Again, here’s some video of the thing in motion:

<https://www.youtube.com/watch?v=op9kVnSso6Q>

<https://www.youtube.com/watch?v=p2OPUi4xGrM>

**Bench Press**

OK, I like to do these inside the power rack for safety, but at a bare minimum, make sure you have a bench with at least 2 rack height options.

Step 1. Put an empty bar in the rack at a height that you can reach without going to full extension.

Step 2. Set up so that you have both feet on a hard surface (the floor is typical), with the bar above your eyes.

Step 3. Take a double overhand grip on the bar wider than shoulder width.

Step 4. Remove the bar from the rack and hold it directly above the shoulders.

Step 5. Lower the bar to the chest, just above the nipples, with THE ELBOWS TUCKED IN TOWARDS THE RIBCAGE.

Step 6. Look at the forearms – they should be vertical. If not, put the bar back in the rack, and widen or narrow your grip. Repeat until the forearms are vertical in the bottom position.

Step 7. 10 reps with just the bar.

Step 8. Add 10kg to the bar and do 3 sets of 5 reps. That’s the first bench press session done. Subsequent sessions add load in 5kg increments, then in 2.5 kg increments. Then 1kg.

Video :

<https://www.youtube.com/watch?v=rxD321l2svE>

1. Chin up

Step 1. Find the chinup bar.

Step 2. Attach yourself to the bar with a double underhand grip (palms towards you), grip just wider than shoulder width.

Step 3. Hang from the bar at full extension of the elbows and shoulders.

Step 4. Pull up UNTIL THE BAR TOUCHES THE MID-CHEST. CANNOT EMPHASISE THIS ENOUGH. BAR TO MID-CHEST. Not the chin. Not the shoulders. THE MID CHEST.

Step 5. Lower (slowly) to the full hang position.

Step 6. Repeat as appropriate.

If you can’t do one of these with this form, then we do ‘jumping chinups’. Here, rather than starting at the full hang, we jump to the bar and use that upward momentum to help us pull up to the top position, then lower slowly to the full hang, then dismount the bar (that’s one rep). 3x5 jumping until we can do ‘non’ jumping.

Video:

<https://www.youtube.com/watch?v=Yrzap8ycnRU>

1. Overhead press

Step 1. Grab an empty bar with a double overhand grip, hands just wider than shoulder width apart. Lift it to this position:

This is the start position of the overhead press. When this gets heavy, you will need to set up in the squat rack, but at the beginning, this is not really needed. Stand with feet hip width apart.

Step 2. Tuck the chin and pull the head back. DON’T LEAN BACK, just tuck you head back as far as you can.

Step 3. Press the bar overhead. Think about throwing it through the ceiling (but of course, don’t let go and throw it, that would be very bad …).

Step 4. When you think the bar is at the top, shrug the shoulders and make sure the elbows are straight (not necessarily locked, but unbent). The bar should be over the ears and shoulders (which should align).

Lower the bar back to the start position, taking care to keep it as close to the face as possible on the way down (without scraping your nose off).

10 reps and the warmup is done

Add 10 kg, 3 sets of 5, first workout done. Add 2.5 kg each session until you can’t, then 1kg increments.

Video:

<https://www.youtube.com/watch?v=8dacy5hjaE8>

Final notes:

1. Don’t be in a rush to get stuck at ‘too heavy’. Make smaller jumps rather than larger jumps in load. We’re going to be at this for a long time, so heavy loads will arrive – take your time to get there. The early loads prepare your body for the later loads. If you rush over the early stuff, you end up lifting heavy with a body that’s not prepared for it. Result: injury, loss of training time and loss of hockey.

2. Train with a mate who can check your form. If there’s doubt that you’re doing it right, take some load off the bar and see if it looks different when lighter. If it does, then the load was probably too much. Make a smaller increase.

Recommendations for group 3:

Without access to the implements needed to load you heavily, we are not able to work on absolute strength. What we can do, is work on strength-endurance – how long you can express your current strength for. These methods will also increase absolute strength, but much less than the group 2 guys who are in the gym.

Your Day 1 and 2 workouts are the same and they are a circuit of Goblet squats, Pushups, bridges, and chin-ups. 3 rounds. So it looks like this:

Goblet Squat

Pushup

Bridge

Chinup

Goblet Squat

Pushup

Bridge

Chinup

Goblet Squat

Pushup

Bridge

Chinup

Every WEEK, we look to add 2-3 squats, 1-2 pushup, 1-2 bridge, and 1-2 chinup. That might not look like mush, but over 5 months, that’s 40-60 squats, and 20-40 more of everything else. Beginning repetitions are whatever you can do, if you stop with 1-2 reps left in the tank (5 reps left for goblet squat).

Here’s how to do the exercises:

**Goblet Squat**

This is an exercise that helps us prepare you for good quality squatting later in the program. Grab a kettle bell or a dumbbell, if you have one. If not, ANYTHING can act in it’s place – 10L container of water from the supermarket, for example. About 5-10 kg is appropriate. The load exists in this exercise (at the start, at least) for the purposes of balance- not to cause adaptation. So, it’s not beneficial to use a really heavy load – just enough to help you balance. You certainly can use heavier loads in this exercise cause a strength adaptation, but in our scenario, we don’t have access to these tools, so don’t stress about the load.

Video:

<https://www.youtube.com/watch?v=fnuHKfySEsU>

**Pushup:**

Check out the video below: below:

<https://www.youtube.com/watch?v=i9sTjhN4Z3M>

Starting reps will be wildly variable – go with what you can do minus 1-2 reps and work up from there. Tuck the elbows closer to the ribs, rather than having them wide, away from the body.

**Bridge**

Check the video below:

<https://www.youtube.com/watch?v=Q_Bpj91Yiis>

With regard reps and execution, squeeze the glutes hard and pull yourself, with control, from the bottom position to the top, hold for 3 seconds, and then lower SLOWLY with CONTROL back to the bottom position. DO NOT RELAX at the bottom position – touch your butt to the floor GENTLY and BRIFLY, and then go back up again. 8 reps to start with.

Chin up

Step 1. Find the chinup bar.

Step 2. Attach yourself to the bar with a double underhand grip (palms towards you), grip just wider than shoulder width.

Step 3. Hang from the bar at full extension of the elbows and shoulders.

Step 4. Pull up UNTIL THE BAR TOUCHES THE MID-CHEST. CANNOT EMPHASISE THIS ENOUGH. BAR TO MID-CHEST. Not the chin. Not the shoulders. THE MID CHEST.

Step 5. Lower (slowly) to the full hang position.

Step 6. Repeat as appropriate.

Video:

<https://www.youtube.com/watch?v=Yrzap8ycnRU>

If you can’t do one of these with this form, then we do ‘jumping chinups’. Here, rather than starting at the full hang, we jump to the bar and use that upward momentum to help us pull up to the top position, then lower slowly to the full hang, then dismount the bar (that’s one rep). 3x5 jumping until we can do ‘non’ jumping.

OK, this gets us to the end of BLOCK 5. Get amongst it.