



Fitness Frontline

Using the
fitbit[®]
system to

- prescribe
- measure
- manage &
- monitor

Aerobic fitness

Digital



National Fitness
Australia



Hi, I'm John Miller, Canberra (Australia) based physical educator, Managing Director of corporate and community health, fitness and wellbeing company, Miller Health P/L.

We conduct health, fitness and wellbeing programs and assessments for corporate organisations and individuals – all designed to inspire and motivate people to keep themselves fit and healthy to the best of their ability.

The books, videos and audio files we publish cover a range of health, fitness and wellbeing topics - which are distributed via the internet through a range of websites, in particular <http://www.fitandhealthyonline.com/>

Our vaulting ambitions include

- driving fitness into the frontline of health care. (It's a tough assignment expecting to stay healthy without keeping yourself fit.)
- encouraging the fitness industry to take a leading health care role and
- having the Fitbit aerobic fitness zone system used universally to aid in the prescription, measurement, management and monitoring of aerobic fitness by individuals and medical, fitness, nutrition and counselling practitioners

I use and recommend the Fitbit aerobic fitness zone system as an essential element of a regular and systematic aerobic fitness training program.

I keep track of the number of zone points I achieve each day and each week. I've worked out that 40 points a day is good, 50 better and 60 best. 250 zone points a week is a reasonable target for anyone wanting to improve or maintain good metabolic health.

I have several workouts during which I can score zone points:

- zone 1 - walking and jogging with my constant exercise companion, Honey
- zone 1 – 40-minute strength training workout in the gym
- zone 2 - interval training while walking and shuffling around the streets and on the local oval
- zone 2 - working out on my Johnson stepper

Fitbit Aerobic Fitness Prescription

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Honey



Index

If you want to cut straight to the chase, go to Fitbit Zone System section on page 16

Foreword	4
Let the animal run loose	5
1. Hourglass Aerobic fitness	6
2. Bad news – good news	7
3. The clinical aerobic exercise prescription	8
4. The investment – time, effort and money	9
5. The metabolic health engine	10
6. The metabolic health defrag	11
7. The mental health defrag	12
8. Lifestyle choices	13
9. Reactive medicine	14
10. Pro-active health, fitness and wellbeing maintenance	15
11. THE FITBIT HEART RATE ZONE SYSTEM	16
12. Fitbit zone points – where time meets effort, rated against heart rate	17
13. How long do you need to exercise in any one session?	19
14. Aerobic fitness training recommendations – good, better, best	21
15. Share your results with trusted third parties	22
16. Fitbit, an exercise physiology grade device	24
17. 20m RUN - premier test of aerobic fitness	25
18. 20m run scoring tables	27
19. Universal Fitness Test – for regular folks	28
20. Universal fitness test - scoring table	29
21. Elite fitness test - scoring table	30

I can give you the program but I can't do it for you.
Kenneth Cooper



FORWARD – UPWARD - ONWARD

Aerobic fitness is an essential ingredient in the mix of lifestyle factors designed to keep your metabolic (and mental) health systems in good condition. Lack of vigorous aerobic exercise is causing an epidemic of personally-generated metabolic dysfunction that only a regular and systematic aerobic exercise program can personally 'un-generate'.

We live in the sedentary age. We don't move enough. There's a war going on between our need to move more and more and technology which is working flat out, encouraging us to move less and less – removing just about all physical activity from our lives, particularly our working lives. Technology is winning, hands down.

So, if you can't put the exercise back into your work, then you're going to have to do it as a recreational activity in your own time. For that you need four things; **focus, discipline, persistence and habit**. We are creatures of habit. John Dryden wrote, '*We make our habits, then our habits make us.*' Jum Ryun, World mile record holder said, '*Motivation is what gets you started. Habit is what keeps you going.*'

The Fitbit aerobic exercise zone concept outlines a way of 'doing' aerobic exercise that lets you know exactly how much you're doing and its metabolic (and mental) health value. And remember, what's good for the heart is good for the whole of your body.

The Fitbit aerobic fitness prescription

The Fitbit zone concept contains an aerobic fitness prescription dosage, based on time (frequency and duration) and effort, rated against (estimated) age-related, maximum heart rate.

Using the Fitbit aerobic fitness zone system, you can set a daily/weekly target of how much aerobic exercise you plan to do, keep track of just how much exercise you're doing and let other people know what you've done.

John Miller

Acknowledgement

In 2020, Fitbit Australia generously donated a number of Fitbit wearables to Miller Health, the objective being to assist IT students at Canberra University in the development of a number of aerobic fitness prescription and monitoring projects.

The main outcome was that I came to a deeper understanding of just how good the Fitbit data collection system is and its usefulness in the prescription, measurement, management and monitoring of aerobic fitness in the community. It stands to revolutionize the fitness, medical, allied health and corporate health industries.

Disclaimer

The contents and illustrations of this book have not been authorized by the Fitbit organization. The ideas expressed are my own, based on my experience using a Fitbit Sense watch for well over 12 months. I recommend the Fitbit system and have found it to be highly motivating.

I'm grateful to Fitbit Australia for their encouragement and support.

John Miller

Let the animal run loose



Herb Elliott, *'giving it the herbs'* on his way to winning the 1960, Rome Olympics 1,500m gold medal in world record time - 3.35.6.

This book is dedicated to Herb Elliott, one of the world's greatest middle-distance runners.

When I was a kid, if someone was driving a car and you wanted them to go faster, you'd say to them, *'Give it the herbs'*. The www.dictionary.com definition of the word 'herbs' is, (*Australian Slang*) *'... to use full power, especially in accelerating a car.'*

In 1995 when I first dreamed up the idea of an aerobic fitness prescription based on time and heart rate, I thought that the name of the prescription ought to be 'herbs', first from the 'dictionary' definition and secondly in honour of Herb Elliott. The fact that in this context, the word 'herbs' would not have resonated with the rest of the world, led to the coining of the word, *'Aerabyte'* – a byte of aerobic exercise.

That's all in the past. Fitbit has developed an exercise prescription and monitoring system far in advance of any system I could have developed myself.

In future, when you think of fitness, think about 'giving it the herbs', and think of Herb Elliott, who at age 22, running on a cinder track, won the gold medal in the 1,500m at the 1960 Rome Olympic Games in the world record time of 3.35.6. With that time, he would have won 9 of the last 15 Olympic 1,500m gold medals, (including Japan 2021) and marked him as a contender in the rest.

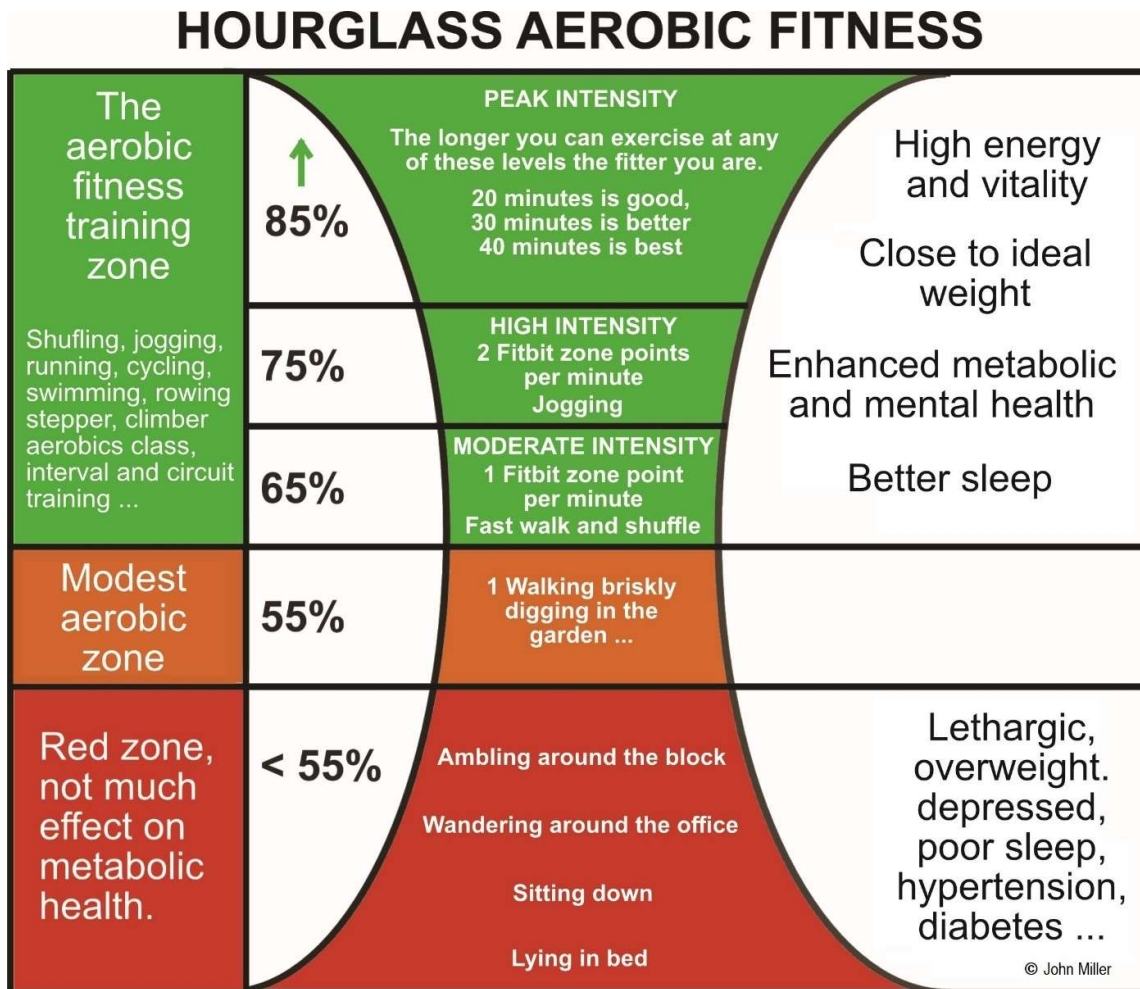
In 1995 while I was working at the Australian Institute of Sport, Herb autographed my copy of his book, *'The Golden Mile'*, adding the postscript, *'Let the animal run loose.'*

1. Hourglass aerobic fitness

It's a big ask expecting to stay healthy without keeping yourself fit.

It's an even bigger ask expecting to get better by having someone do something to you – sooner or later you have to do something to yourself.

To keep yourself in good physical condition, exercise in the Hourglass Aerobic Fitness green zone. 40 Fitbit zone points a day is good, 50 is better and 60 is best.



I use and recommend the Fitbit aerobic fitness prescription and monitoring system. I find fitness zone system and the way results are presented, during, at the end of a workout and at the end of the week highly motivating.

Fitbit has defined the difference between moderate, high intensity (vigorous) and peak intensity exercise. Exercising in any of the three zones improves metabolic health.

The Fitbit heart rate intensity zones are calculated on a number of factors, including (estimated) age-related maximum heart rate and resting heart rate. The percentage figures in the Hourglass Aerobic Fitness model are based on both Fitbit's guidelines and my own experience.

John Miller

2. Bad news – good news

THE BAD NEWS

The symptoms of poor metabolic health are legion, including obesity - type 2 diabetes - high blood pressure - elevated cholesterol - cardio-vascular dysfunction - sleep apnoea - blue and black moods - lack of energy - poor sleep ... That's the bad news.

THE GOOD NEWS

As soon as you embark on a serious aerobic fitness training program there's a high likelihood that the symptoms of personally-generated metabolic (and mental) health dysfunction will begin to disappear, not overnight of course but gradually. Clues that this is happening is your resting heart rate goes down and your heart rate variability goes up. (Fitbit automatically provides you with this information.)

When it comes to how quickly you're going to restore poor metabolic health to good, just keep in mind the number of years it's taken to get to where you are now and the severity of your dysfunction.

All it takes to improve your aerobic fitness is a bit of time and effort. Compared with visits to the doctor and the chemist, it doesn't cost much, even if you have to go to a gym to work out on their strength training machines.

HOW FIT ARE YOU?

Included in this book is the **20m run test of aerobic fitness test** and the **Universal fitness Test** so you can gauge your level of aerobic fitness and the status of your metabolic health.

THE CATCH

When it comes to the **Fitbit Aerobic Fitness Zone System**, the only catch is that you have to do the exercise yourself. It's not something you can sub-contract out or get from a bottle or a tube.

20 minutes a day is good, 30 minutes better, 40 minutes best.

If you're struggling to find 40 minutes, consider taking 40 minutes off your TV time, or off your sleep. If you take it off your sleep, you'll sleep better and need less sleep. Go to bed earlier: you'll get up earlier. (Fitbit tracks how much sleep you're getting and the quality of the sleep.)

If that doesn't work, you're not fair dinkum. And if you're not fair dinkum about looking after your health, who else do you think should worry about it?

In my estimation, if you can get 250 Fitbit zone points a week there's an 80% chance that for 80% of people, they'll get themselves back to 80% of good metabolic health in around 80 days. Them's not bad odds.

Good times to exercise are in the morning, after work, and on the weekend. Training with an exercise partner makes the discipline just that much easier.

TRAIN HARDER AND SMARTER

Most people don't train hard enough or long enough to receive the metabolic and mental health benefits. They don't know how hard they need to train. Unless they've been serious about their sport – and that's less than 20 percent of people – they've never trained hard. They've never experienced the joy of effort. And for a lot of people, once they stopped playing sport they never trained again.

The American College of Sports Medicine's exercise recommendations are:

' ... a minimum of 30 minutes of moderate intensity aerobic activity a minimum of five times a week OR 20 minutes of vigorous intensity aerobic activity a minimum of three times a week.'

It's a limp and useless guide because it doesn't (in clinical or scientific terms) define the meaning of the words 'moderate' or 'vigorous'. It's like prescribing a pharmaceutical medicine with the dosage defined as 'moderate' or 'high' instead of the exact amount of active ingredient.

Fitbit has changed all that. The Fitbit zone system has defined what 'moderate' and 'vigorous' are. Both moderate exercise and vigorous exercise are beneficial.

3. The clinical aerobic exercise prescription

The Fitbit model of a clinical aerobic exercise prescription is based on the formula:

AEROBIC FITNESS PRESCRIPTION		
<u>Frequency</u>	<u>Duration</u>	<u>Intensity</u>
- times a week	- length of each session	- the 'dosage', rated against a percentage of maximum heart rate

Training with 'moderate intensity' starts with getting your heart rate over (circa) 60% of your (estimated) age-related heart rate (220 minus age). It's not a tough assignment. Your Fitbit will tell you when you've reached this target, giving you 1 Fitbit zone point per minute. Your Fitbit will also tell you when you've reached the next target of (circa) 75% of your maximum heart rate – for which you'll get 2 Fitbit zone points per minute.

Too many people have never experienced the discipline that comes with training within the first or second fitbit zone. Their metabolic system has never been put to the lung panting, heart pumping test. They never get a good sweat up. You can see it in their bodies.

The advice to start a new aerobic fitness training program gradually is good advice. You don't want to run at it *like a bull at a gate* or *'bust your boiler'* and overload your metabolic and musculo-skeletal body systems. Too many people started off too hard, too soon and ended up giving it away.

Once you get back into the routine of a regular aerobic fitness training program, you'll gradually build up your aerobic fitness. In fact, you will be forced to build up to it gradually. Your body won't let you work too hard, too soon.

THE SECRET TO MAINTAINING YOUR AEROBIC EXERCISE PROGRAM

- Exercise with a friend. You'll keep each other honest.
- Organize to meet at specific times.
- Get yourself a Fitbit smart watch to monitor your training sessions.
- Keep track of your heart rate and zone points and share your results with friends.



To change one's life: start immediately.

William James

4. The investment –time, effort and money

1. Heart rate monitor

I highly recommend you purchase a Fitbit heart rate monitor so you can check to see whether there's enough vigor in your exercise program. The Inspire 3 and Sense versions come highly recommended. They are exercise-physiology-grade devices. My own watch is the Sense.

We've reached the digital age and your Fitbit will collect your aerobic training data, store it (somewhere in the clouds!) where it will be accessible in detail using the Fitbit smart phone app.



Inspire 3

Sense

Fitbit takes the hard work out of fitness training monitoring.

It may take you less than a minute to get your heart rate into the 1 point per minute Fitbit zone. If you're jogging, it will only take another minute or so to get your heart rate over 75% or however high you want it to go. Once you've reached your training heart rate you can slacken off a bit but still keep it ticking over at your desired heart rate.

I recommend you use the Fitbit system to keep track of your resting heart rate. It's another measure of metabolic health. As you start exercising more, you'll probably notice a decline in your resting heart rate.

2. Weight and percent body fat scales

I also recommend you invest in a set of Fitbit Aria bathroom scales that measure both weight and percent body fat. The results are synced to your Fitbit phone app.

Weigh yourself each day after your morning shower.

This will keep you focused on your weight goals – whether maintaining an ideal weight or reducing weight.



3. Blood pressure monitor

Keep track of your metabolic health with your own personal blood pressure machine. Take your blood pressure at the same time every day. Taking your blood pressure at the end of a meditation session sounds like a good idea – ten minutes on your own, with your eyes closed thinking about nothing.



Purchase a blood pressure monitor that is Bluetooth compatible.

MEASURE YOUR LEVEL OF AEROBIC FITNESS

Included in this book is information about the 20m run test of aerobic fitness.

After taking thousands of people through the 'Beep Test' I came to the conclusion that a five minute, 20m shuttle run was more than adequate.

The test is to see how many laps you can complete in 5 minutes.

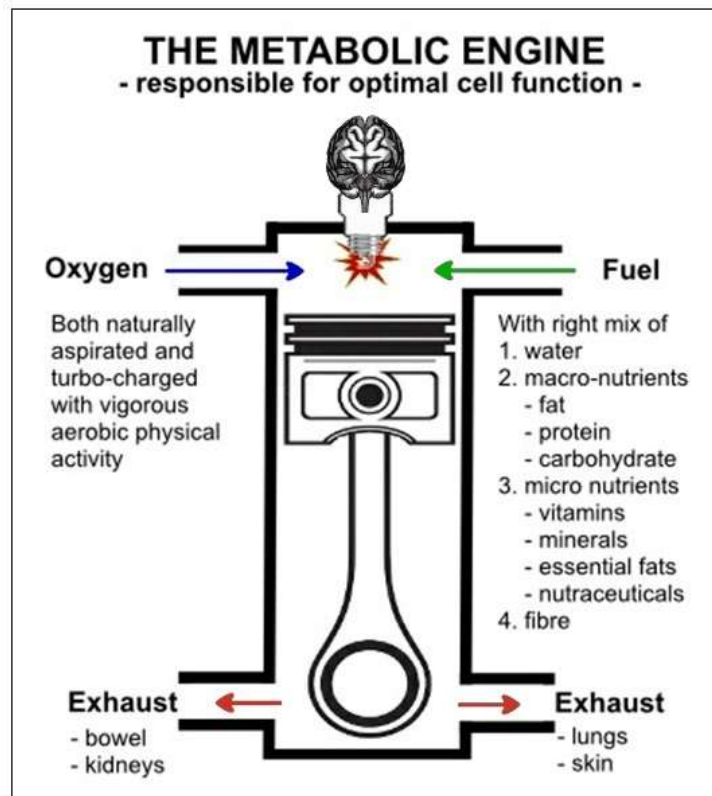
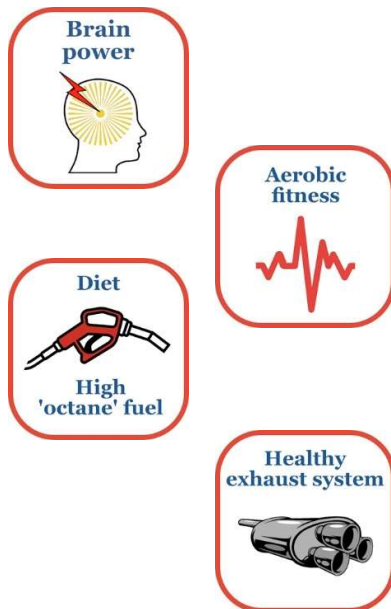


5. The metabolic health engine

In an age when personally-generated metabolic dysfunction is the most pressing of health issues, it's important to realize the role that vigorous aerobic exercise plays in improving the efficiency of the process that

- delivers oxygen and essential nutrients to every cell in body and
- removes the waste products of metabolism from those cells.

Good metabolic health is driven by:



THE METABOLIC HEALTH 'TURBO-CHARGER'

The aim of an aerobic fitness training program is to '*turbo-charge*' the process of getting oxygen into every cell in the body and stimulate the elimination of the waste products of metabolism from every cell back into the outside world. Coupled with '*high octane*' fuel and you have the essential elements of good metabolic health.

The purpose of this book is to make the case for dramatically boosting your aerobic fitness.

The **Fitbit Aerobic Fitness Zone System** is based on

- the frequency of your training sessions – i.e., how many times a week
- the duration of those sessions and
- heart rate intensity.

When you use this formula and the Fitbit monitoring system, you'll know if you're getting sufficient aerobic exercise to improve and maintain good metabolic health.

6. The metabolic health defrag

Using a computer analogy, one of the effects of regular vigorous aerobic exercise is to give the body a 'metabolic defrag'. Prior to a computer defrag, an analysis of fragmented files looks something like this:



After the defrag, it looks like this:



If there was a similar process to 'defrag' your own body, how much better would you feel?

Well, there is. It's called vigorous aerobic exercise and if it comes in the right dosage, you'll feel better.

In fact, if you maintain your exercise regime over the years, age 70 will be the new 50.

THE BODY AS AN ECOSYSTEM – all parts working together

The body is an ecosystem in which all parts are interrelated.

If one part of the ecosystem shows signs of dysfunction, there's a fair chance there will be other parts of the system that are not functioning well either.

Added to that, dysfunction in one part of the system may lead to dysfunction in another.

The good news is that if you improve the health of one part of the ecosystem, then, just as a rising tide lifts all ships, there's a good chance the health of other parts will improve.

As Bill Clinton might have said, *'It's the system, stupid!'*

With a metabolic defrag we're seeking to bring about a grand improvement in the metabolic health ecosystem. Of course, improving aerobic fitness won't do that on its own. However, it will make a significant contribution to restoring poor health to good.

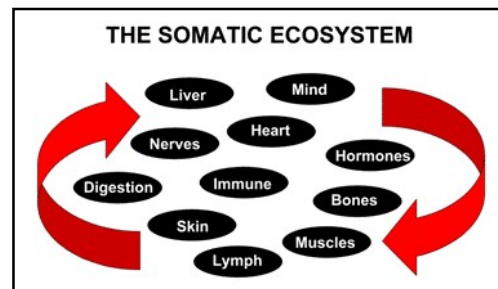
To give an example of the interrelation of different body systems we're familiar with the **psycho-somatic relationship**, where what's going on in the mind, particularly the subconscious mind may show up in other parts of the body as high blood pressure, irritable bowel, sleeplessness, rashes, muscle tension, musculo-skeletal pain ...

We are less familiar with the **somato-psychic relationship**, where things happening in other parts of the body will affect our mind.

The best way to approach dysfunction of the mind is to treat the mind as if it were inside the body instead of appearing to be suspended outside the body on top of your neck. That may assist you to see more clearly the relationship between metabolic health and all the major body systems, including the mind. What's good for the heart is good for the head.

In the future when you hear people talk about poor mental health, it's causes and treatments, listen to see if they refer to the 'metabolic health ecosystem system', if not in the same sentence or paragraph at least sometime before they stop speaking. Simply focusing on a symptom that's manifest in one part of the body will most likely lead to a poor diagnosis of causation which in turn may well lead to symptom-masking treatment that is unlikely to restore poor function to good.

The cause of the 'pain' is rarely at the site of the pain. It's the system.



* Soma (Greek) meaning body.

7. The mental health defrag

There is an epidemic of poor mental health. Too many people are on the blue and black end of the mood scale.



The green, orange, blue and black moods are related to your environment, your general metabolic health and what's going on inside your head. Here's the defrag model (again).



When it comes to the black dog of clinical depression, there's evidence that physical activity has as much or an even greater beneficial effect after one year, than a year's supply of fluoxetine. (Find that hard to believe? Read psychiatrist David Servan-Schreiber's book 'Healing Without Freud or Prozac' or John Abramson's book, 'Overdosed America'.)

Servan Schreiber outlines the results of a study from researchers at Duke University who compared the anti-depressant effects of jogging with those of Zoloft.

'After four months patients treated with either approach were doing well. On the other hand, a year later, there was a major difference between the two types of treatment. More than a third of the patients who had been treated with Zoloft had relapsed, whereas 92 percent of those who had followed the jogging programme were still doing well.'

Abramson refers to depression as the 'exercise deficiency disease'. He goes on to say that 'short-term treatment with an antidepressant medication relieves symptoms but appears to decrease the likelihood of patients making the positive life changes necessary to prevent symptoms from recurring.'

If that's not good enough for you, go to the journal, Psychosomatic Medicine 62:633-638, 2000 and read the results of the study 'Exercise Treatment for Major Depression'.

What the experts are saying is that for those mental health issues that are generated by metabolic dysfunction the need for a metabolic health intervention needs to be considered. That means the prescription of diet and aerobic exercise.

There are (at least) 3 issues involved in the prescription of aerobic physical activity for depression.

1. Not enough doctors 'do' aerobic exercise. 'Fitness' is the word that dare not speak its name. As a general rule, it's fair to say that 'fitness' is below the medical industry's pay grade. Few doctors prescribe it at all. Those who do, usually fail to prescribe it in a sufficient dosage for it to be effective.
2. The fitness industry hasn't yet switched on to servicing this market. It's considered above their pay grade.
3. The counselling industry – particularly the psychiatric branch - isn't switched on to aerobic exercise either. The pill reigns supreme!



8. Lifestyle choices

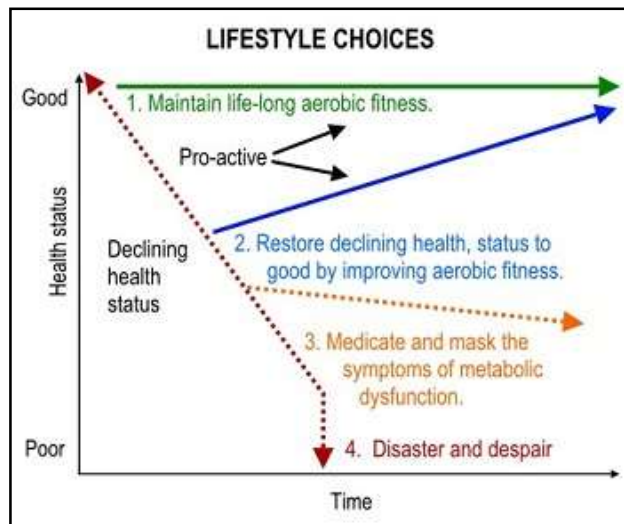
Popular medical industry practice is to prescribe drugs to mask the symptoms of poor metabolic health rather than prescribe exercise of a sufficient dosage that people can follow to improve it themselves.

In a sedentary world that's also awash with junk food, you can be pretty certain that the symptoms of metabolic dysfunction are not caused by the lack of pharmaceuticals.

Where I come from, prescribing drugs to mask symptoms, without a clinical exercise prescription is known as junk medicine. All that does is slow down the rate of decline in health status. For all intents and purposes, poor metabolic health gets worse, not better.

In the **lifestyle choice** model, there are four ways to go:

1. Maintain a lifelong aerobic fitness habit.
2. Restore poor function to good by becoming aerobically active after a decline in metabolic health status due to a period of sedentary behavior.
3. Maintain the sedentary lifestyle: mask the symptoms of poor health as a way of slowing down the decline in health status without restoring poor health to good.
4. Maintain the sedentary lifestyle and do nothing to avert impending disaster and despair.



For the first time in history medical, allied health and fitness practitioners can write out the aerobic fitness prescription that includes frequency, duration and intensity, one that you, yourself can take and do to restore poor metabolic function to good.

The symptoms of metabolic dysfunction are well known. So are the symptom-masking medications. However, headaches are not caused by a lack of Tylenol, high blood pressure is not caused by a lack of Avapro, poor sleep is not caused by a lack of Stilnox, adult-onset diabetes is not caused by a lack of Gliclazide, high cholesterol is not caused by a lack of Lipitor, clinical depression is not caused by a lack of Prozac, obesity isn't caused by a lack of gastric banding any more than piles are caused by a lack of Anusol.

OK, there's a place for medication while things settle down, but not, if you can help it, for the long term.

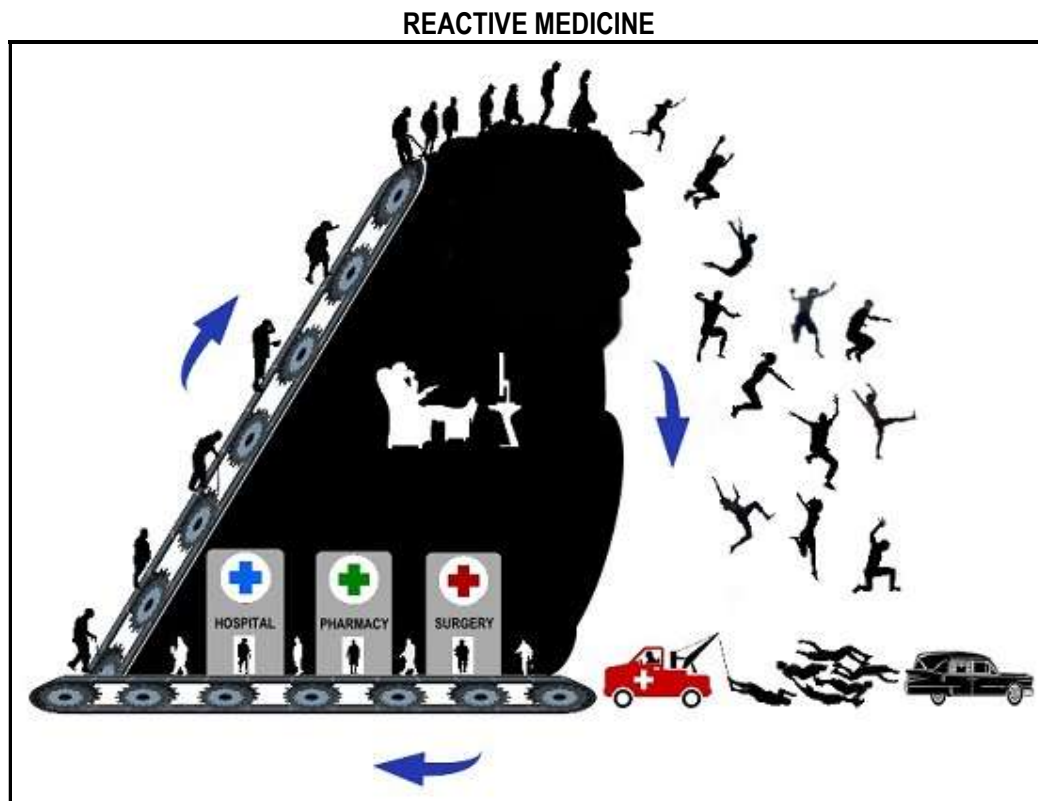
There is a constant struggle between our need to move more and more and the pressure of science and technology to design and produce machines that enable us to move less and less.

Garry Egger

9. Reactive medicine

The sedentary lifestyle is the highway to personally-generated metabolic dysfunction. Here's how it works.

1. As people strip all physical activity out of their lives, they move closer and closer to the metabolic health cliff face. Once there, all it takes is a zephyr to tip them over the edge. For some it takes less than that: they tip or topple off of their own accord. Others have such an aversion to aerobic fitness that they literally fling themselves over the edge.
2. At the bottom of the cliff are the 'ambulances' waiting to pick them up and dump them on the symptom-masking traveller where they'll be booked into either the surgery, pharmacy or the hospital (or all three). Once patched up they'll traipse back to the escalator which lifts them back to the top of the cliff – ready for the next round of tipping, toppling and flinging.



If you've got a fitness-generated problem it needs a fitness-generated solution - otherwise things only get worse.

And don't for a minute think that the common symptoms of metabolic dysfunction are diseases. High blood pressure is not a disease, neither is high blood cholesterol or adult-onset diabetes. For most people they're just symptoms of personally-generated metabolic dysfunction.

Providing the dysfunctionality is caught early enough, with a good aerobic fitness maintenance program, (and a healthy diet) there's more than a fair chance that body systems will soon be functioning normally – or at the very least, much better.

It was Lao Tzu who said something to the effect that a big problem could have been solved easily when it was a small problem.

That's very old wisdom that makes very good sense today. Which leads us on to the concept of systematic, **pro-active health maintenance**. ('Preventive Health', bah humbug.

You don't prevent health, you encourage and foster it. You do the things that make and keep yourself healthy.)

11. The Fitbit heart rate zone system



Using the Fitbit heart rate zone system to prescribe, measure, manage and monitor aerobic fitness.



12. Fitbit zone points, where time meets effort – rated against heart rate

Trying to improve your aerobic fitness without an exercise prescription that includes frequency, duration and intensity is like taking a pill that comes without an active dosage and without instructions on how often to take it.

Without a definition of intensity, based on time and heart rate, the exercise guidelines recommended by the American College of Sports Medicine and the Centre for Disease Control are an unscientific nonsense: *'All healthy adults aged 18–65 yr should participate in moderate intensity aerobic physical activity for a minimum of 30 min on five days per week, or vigorous intensity aerobic activity for a minimum of 20 min on three days per week.'*

This sort of prescribing routine is one of the root causes of the inability of the medical industry to restore people with general metabolic dysfunction to good health. Doctors can't complain that they're too busy when their diagnostic and prescribing practices guarantee that their customers will soon be back slumped in the surgery waiting room.

A good aerobic fitness program requires a dosage involving **frequency** (times a week), **duration** (length of each session) and **intensity of effort** (based on heart rate). This rule forms the basis of the **Fitbit Aerobic Fitness Zone System**.

If you're serious about becoming aerobically fitter, merely recording time, steps or distance is pointless unless effort is also taken into account.

Zone Points	=	Time	x	Intensity of effort
		(in minutes)		(on a scale where points per minute are matched against heart rate)

Fitbit calculates the number of zone points you've accumulated using a formula based the actual time (T) in minutes, maximum heart rate, resting heart rate and heart rate reserve. Below it a rough guide, based on percentage of maximum heart rate. It's a close estimation of how Fitbit calculates the Fitbit zones.

Fitbit has two aerobic fitness training zones:

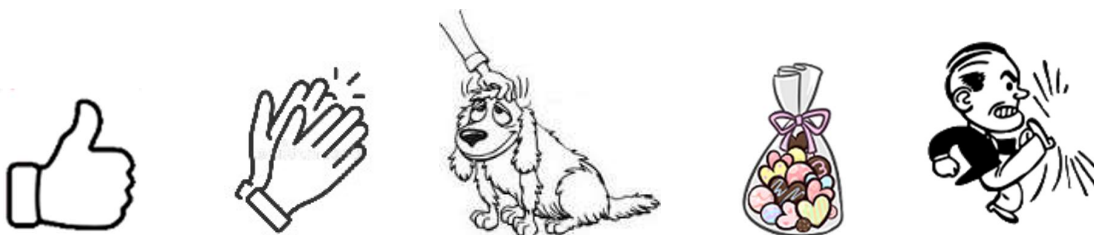
- **Zone 1:** if you get your heart rate over (circa) 60% of your (estimated) age-related maximum heart rate (220 minus age) you get 1 point per minute.
- **Zone 2:** if you get your heart rate over (circa) 75% of your maximum heart rate you get 2 points per minute.

The prescription

A medical, fitness, or allied health practitioner can prescribe a certain number of points a day to improve metabolic and mental health. 50 zone points a day sounds about right for someone wanting to see an improvement in their health.

Monitoring and managing the prescription

On a visit (or by phone or Zoom) to the practitioner, the client can present the results on their Fitbit phone app and receive appropriate encouragement.



Fitbit zone points per minute- based on % of age-related maximum heart rate.										
Effort	Light	Moderate			Vigorous					
Pts/min	0	1			2					
% MHR	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Age										
20	105	114	124	133	143	152	162	171	190	200
25	102	111	120	130	139	148	157	167	185	195
30	99	108	120	130	140	150	160	170	180	190
35	96	105	114	123	131	140	149	158	175	185
40	99	108	117	126	135	144	153	162	180	180
45	94	103	111	120	128	137	145	154	171	175
50	89	97	105	113	121	129	137	145	161	170
55	89	97	105	113	121	129	137	145	161	165
60	86	94	102	110	118	126	133	141	157	160
65	81	88	96	103	110	118	125	132	147	155
70	79	86	93	100	107	114	122	129	143	150
75	76	83	90	97	104	110	117	124	138	145
80	73	80	86	93	100	106	113	120	133	140
85	70	77	83	90	96	102	109	115	128	135
90	68	74	81	87	93	99	105	112	124	130

If you're diligent in your training, over the weeks and months you'll notice that you're able to train with a higher heart rate for longer periods of time. This means you're getting fitter, your metabolic system is becoming healthier.

A minimum of 200 zone points per week (ZPPW) is good, 250 is better, 300 is best and 400 is 'bestest'. I've called over 400 ZPPW a week, 'defrag territory'. Once you start getting 300 or more ZPPW a week you'll keep yourself in pretty good shape. If you want to achieve huge gains in your aerobic fitness and metabolic health, aim at (at least) 400 ZPPW.

Frequency / intensity / duration	Good	Better	Best	Metabolic defrag and 1% weight loss territory
Frequency: based on sessions per week	5	7	9	11
Duration: based on minutes per session	20	30	40	60 (2 x 30)
Intensity: based on heart rate	65%+	>75%+	>85%+	75%+
Fitbit zone points per day	40	50	60	80+
Fitbit zone points per week	200	250	300	350+

'They say' that your estimated, age-related maximum heart rate (MHR) is (roughly) 220 minus your age. Therefore, the maximum heart rate of a 40-year-old person is said to be 180bpm. Aiming to work at 75% of maximum heart rate for a 40-year-old is roughly 135 bpm. If you're a 40-year-old person and you're in good physical condition and aerobically trained, you'll be able to sustain more than 135 bpm for at least 40 minutes.

If you're fitter or less fit than the average fit person, you may need to modify the recommendation.

1. You'll need a Fitbit heart rate monitor connected to a smart phone containing the Fitbit app.
2. Set your Fitbit watch to, 'Workout'. Start the workout. Check what your heart rate is as you go along.
3. You'll soon get a feel for what the two heart rate zones are and adjust the intensity of your workout accordingly.
4. The Fitbit app will start counting zone points from the moment you start exercising at a rate of (circa) 65% of your age-related maximum heart rate. You can view the number of zone points you've generated while your exercising.

13. How long do you need to exercise in any one session?

For 'regular folks', 20 minutes is good, 30 minutes is better and 40 minutes is best.

But having said that, it all depends on how often you train, how long you train and at what heart rate.

Five, 30-minute sessions a week with your heart rate at 75% of your MHR (2 point per minute) will set you up for 300 fitbit zone points. Do that for a few months and you'll really feel the difference.

% of maximum heart rate	Fitbit zone points per minute	Minutes to achieve 50 zone points	Minutes to achieve 250 zone points	Minutes to achieve 300 zone points
75%+	2	25	125	150
65%	1	50	250	300
55%	0			

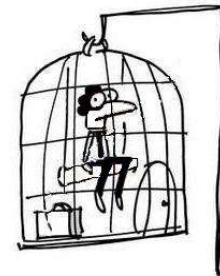
What this means is that the higher your heart rate during your workouts, the less time you have to spend each week getting your recommended number of Fitbit zone points.

If you're in an occupation where you're moving around all day – if you're a gardener, lawn mower, brick layer, parcel deliverer ... – then you may get some of your aerobic activity during work time. Some of the fittest and healthiest people I've seen in the last few years were staff in a botanic garden who spent all week tending the plants and digging up weed.

However, for most people this is not possible because they're cooped up in a cage and chained to a desk or steering wheel all day.

Most of us don't have jobs where we can keep moving around all the time so we have to find some recreational activity that can be done in 20, 30 and 40 minute bursts.

Only that way can we hope to make up for the movement our species was designed to do naturally and stave off the myriad body system dysfunctions that are the result of this motion starvation.



If you've got a sedentary occupation then you need to make extra provision – running, cycling, swimming or using the cardio equipment in the gym – to get the amount of aerobic exercise your body needs. If you don't, sooner or later you can expect key body systems to become dysfunctional. Then it's ambulances at the bottom of the cliff for the rest of your life, or until you wake up to yourself.

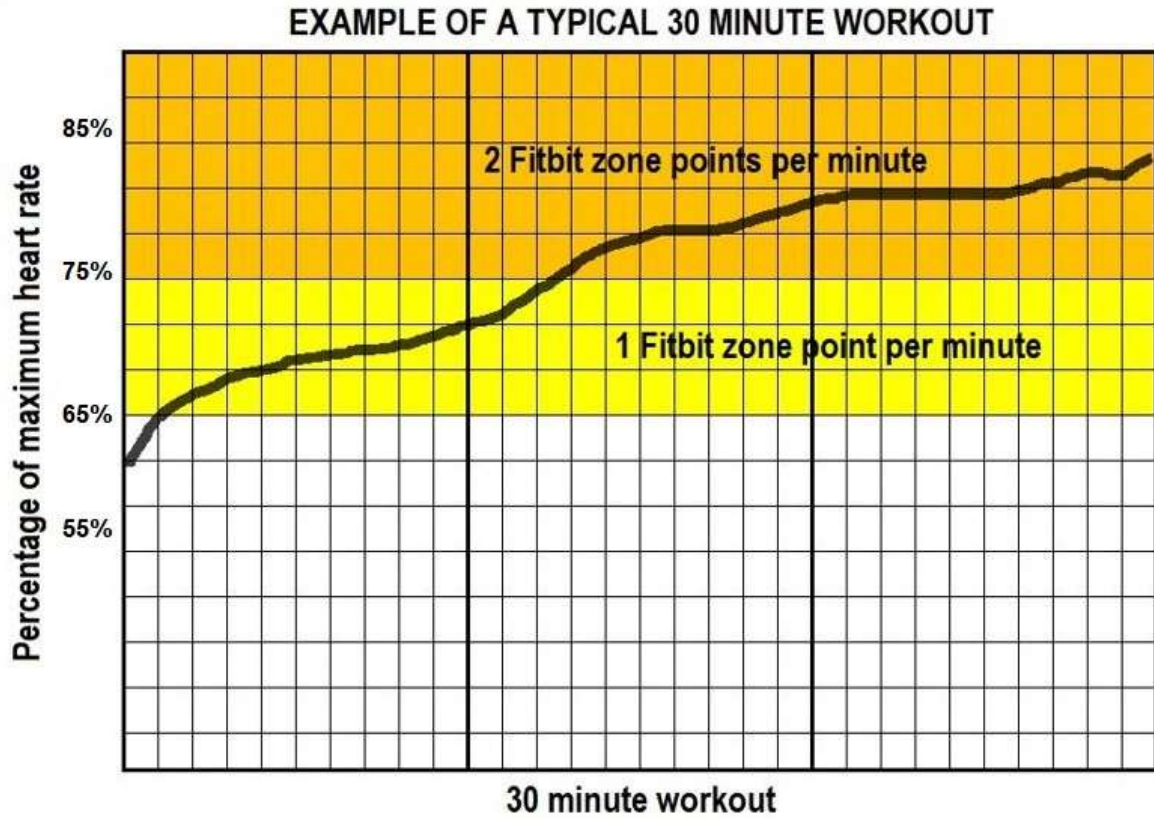
What's happens in our sedentary society is that people do not realize just how little activity they do; they don't realize just how far they've let themselves go. And if they are active, like walking every day, they're not aware of just how fit they are either.

Most people never measure their level of aerobic fitness. Their medical, fitness and allied health practitioners never measure it either.

There are 336 half hours in every week. How many can you find to exercise and keep yourself in good metabolic, musculo-skeletal and mental health? 10 is good, 12 is better and 14 is best.

Nell Gray

Here's what the typical 30-minute workout looks like.



I can give you
the program
but I can't do
it for you.
Kenneth Cooper

14. Aerobic fitness training recommendations – good, better, best

Here they are again.

Frequency / intensity / duration	Good	Better	Best	Metabolic defrag and 1% weight loss territory
Frequency: based on sessions per week	5	7	9	11
Duration: based on minutes per session	20	30	40	60 (2 x 30)
Intensity: based on heart rate	65%+	>75%+	>85%+	75%+
Fitbit zone points per day	40	50	60	80+
Fitbit zone points per week	200	250	300	350+

If you're loaded up with metabolic dysfunction, I recommend you train twice a day.

You may like to split your workout, one in the morning and one in the evening, each of 20 – 40 minutes. I find that if I work quickly between the machines, I can get into fat burning zone for 40 minutes during a strength training workout.

If you've got any of the symptoms of general metabolic or mental health dysfunction, 8 sessions a week would be good, 10 better and 12 best. Too much you say? Well, not if you want to fix up the body system dysfunctions caused by lifestyle neglect.

You can vary the sessions, some hard, some easy, some long, some short.

A WORD OF CAUTION

If you've been sedentary for years, before you embark on your aerobic fitness program it would be wise to get yourself checked out by a doctor to make sure you're not going to keel over after the first couple of minutes of your first activity session.

A WORD ABOUT RESTING HEART RATE – these two images are from my Fitbit phone app on the same day.

Before you get up in the morning, check your resting heart rate on your Fitbit.



Fitbit estimated resting hear rate, 52bpm.

Also check your night-time restoration heart rate. As illustrated on the purple image, your night-time rate may also go 5 or 10 points below your normal resting heart rate.



Same day, sleeping heart rate 40bpm.

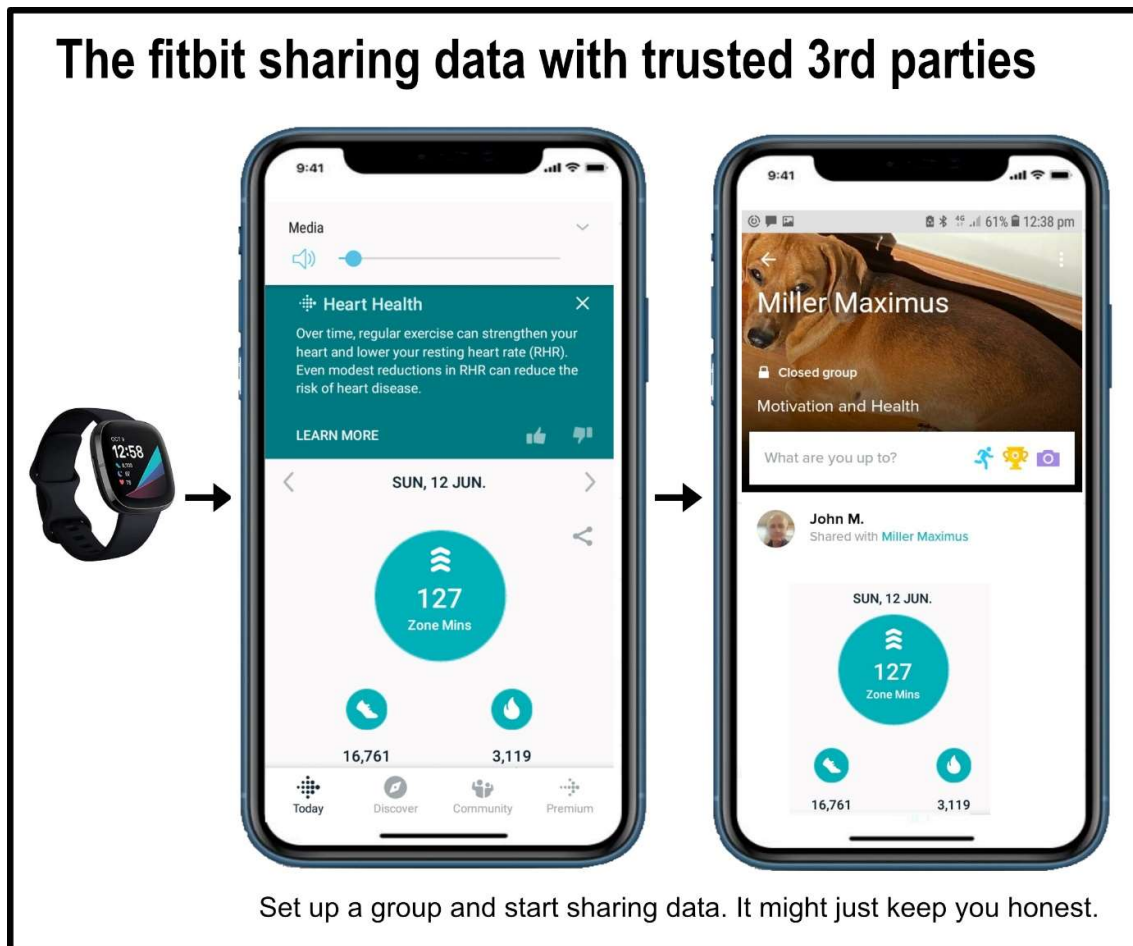
(As a general rule) as your aerobic fitness improves your resting heart rate will go lower.

15. Share your results with trusted third parties



A unique feature of the Fitbit system is that you can share your results with other Fitbit users. Once you've set up the sharing system the members of your group will be able to see how they're going and give each other encouragement. It's a highly motivating system.

I have a group of friends who share their data to my 'Miller Maximus' group.



Using your computer, Fitbit has a system where you can download your weekly data as a spreadsheet and then email the spreadsheet to your medical, fitness or allied health practitioner as an attachment. You can access this system through your fitbit dashboard.

Ideally it would be good for this information to flow seamlessly (automatically) to trusted third parties, particularly so medical, fitness and allied health practitioners can quickly 'bring up' and view your results.

Pathology and imaging results are sent straight to your doctor and brought up on his/her computer screen when you pay a visit. Fitness data needs to be similarly made available.

The model on the next page shows how this could be done.

In the meantime, it's not a tough assignment to download and send off an email with your results as an attachment.

The ideal fitness prescription and monitoring system will work something like this.



Here is a table of results that I recommend be automatically sent to the computer of whoever is prescribing your aerobic fitness training program. You can meet, physically or online, to discuss the results.

Fitness Tracka data base				
Date: Jan 2021	Week	Steps	Zone Pts	Calories
3	Monday	9,708	85	2,647
4	Tuesday	11,963	73	2,765
5	Wednesday	11,823	57	2,773
6	Thursday	5,675	41	2,301
7	Friday	7,882	77	2,407
8	Saturday	8,163	112	2,730
9	Sunday	7,484	84	2,310
	Total	62,698	529	17,933

16. Fitbit, an exercise physiology grade device

Arthur C Clarke said, *'Whatever you think about the future it will be utterly fantastic.'*

It is!

Fitbit is an exercise physiology grade device which will provide yourself, your medical, fitness, nutritional and mental health advisors with an enormous amount of information about your health, fitness and wellbeing.

You'll find it a wonderful motivator.

It's a record keeper par excellence!

- Steps
- Calories burned
- Zone points
- Continuous heart rate
- Resting heart rate
- Sleep restoration heart rate
- Breathing rate
- Heart rate variability
- ECG heart rhythm assessment
- Sleep quality
- Weight and percent body fat – synced from Apia scales
- Core temperature
- Oxygen saturation
- EDA scan

Modern medicine is a wonderful thing but there are two problems: people expect too much of it and too little of themselves.
Don Ardell

17. 20m run – premier test of aerobic fitness

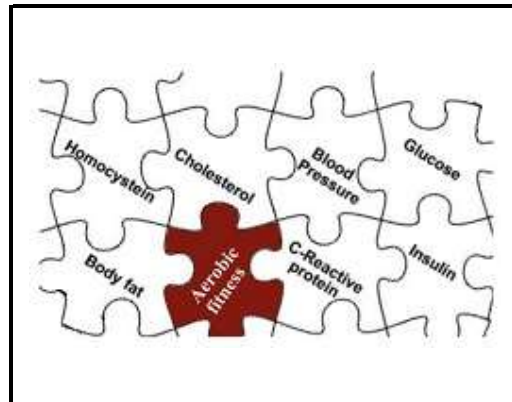


AN ESSENTIAL PART OF A COMPREHENSIVE METABOLIC AND MENTAL HEALTH CHECK

I strongly recommend that the Miller 20m run test be included in the battery of assessments that go with a comprehensive metabolic health check. Without it, a health assessment is seriously compromised and a most fundamental part of the health jigsaw puzzle is missing.

You can do it yourself at home; you can do it under the supervision of your physician at the back of the surgery. You can do it at the gym.

When you can get to 40 laps (men) or 38 laps (women) report back and I'll give you your next assignment! You're in pretty good shape.



Of course, if you're serious about incorporating an assessment of aspects of fitness into a comprehensive health and fitness checkup, you'll need to include tests of strength and flexibility: <http://www.globalbackcare.com>

COMPREHENSIVE MENTAL HEALTH CHECK

Any mental health check is also seriously deficient if it doesn't contain an aerobic fitness test. Mental health is closely associated with metabolic health.

THE USUAL WARNING

If you're in poor physical condition you may wish to have yourself checked out by your physician before doing the 20m run test. Any physician worth his or her salt will have a treadmill in their rooms and an electro-cardiac machine to which they can connect you while gradually increasing the speed and inclination of the treadmill. If they notice any life-threatening cardiac abnormalities, they can stop the test immediately. For regular folks who are overweight and under trained, this is by far the safest way to have your risk of cardiac dysfunction assessed.

The 20m run test is slightly different. It's for people who are not at grave risk of cardiac dysfunction.

You go at your own pace. That's what makes it a safe test. Over the years I've measured some pretty unfit people, two of whom just fell short of doing 10 laps in five minutes. If you can only walk slowly, you'll probably get just over 20 laps. To get 30 laps while walking you'll need to walk exceptionally quickly. Once you've achieved over 30 laps, you're starting to approach what could be called reasonable shape. Over 40 laps for men and 38 for women and I'd say you were in good shape.

At the other extreme I've seen three men get to 60 laps and one woman to 55.

So, pace yourself, don't overdo it. If you have to stop, **STOP!** If you're just running out of puff, slow down, walk or shuffle and then pick up the pace later on. Alternatively, you could walk one lap and jog one lap.

On the other hand, if you're completely exhausted and think you may be doing yourself a serious metabolic injury **STOP, stop immediately** and don't resume the activity.

HOW IT WORKS

The 20m, 5-minute run test has been derived from the 'Beep Test', 20m Shuttle Run, a reliable and valid measure of aerobic fitness, particularly for athletes and very fit people.

However, the 'Beep Test' is not discriminating enough for 'mere mortals'. A lot of regular folks drop out before the end of level 2. They can't last 2 minutes. Plus, you need a CD or tape with the beeps on it and batteries (which run down) for your audio player if you're doing the test outside.

Accordingly, after having conducted thousands of beep tests, I've modified the test so each participant keeps walking, shuffling, jogging or running for a full 5 minutes. In the beep test, after 5 minutes people have done 41 laps. For regular folks this is a good score.

The 20m run test gives 'regular folks' a much better appreciation of their level of aerobic fitness than the Beep Test. How many laps you can do in 5 minutes is a much better gauge of 'where you're at' on the fitness scale, based on what you know you could have done when you were in your prime.

In the 20m run I've rounded the scores off and set the 'good score' target at 40 laps for men and 38 for women.

The 20m run test can be done by anyone at any time. There is no need for any special equipment. Simply mark out a 20-metre distance (close enough to 22 yards) and start moving at a pace which you believe you can sustain for 5 minutes.

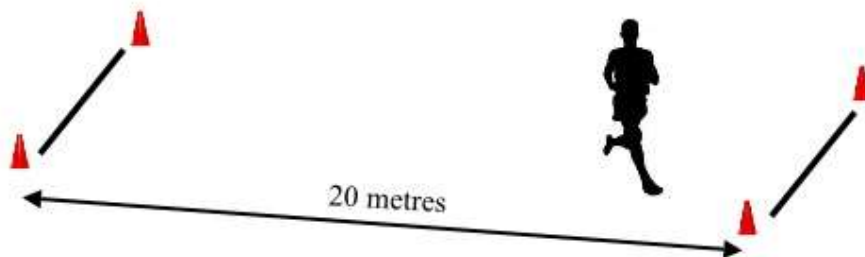
A lot of people have an inflated idea of their level of aerobic fitness. They don't realize how much it's declined over the years. They start off like bulls running out of open gates. Inevitably they slow down.

Another thing about the test is that it is very weight sensitive. Imagine the effort it takes to stop, turn around and then move an extra 20Kg or 30Kg (more than you weighed 20 years ago) to begin the next lap? The corollary is that if you start losing weight you can expect an immediate improvement in the number of laps you can run.

All in all, it's a very good test of aerobic fitness and metabolic function.

If you're not in great shape, don't start off too fast. (Try for 4 laps per minute for the first minute and then judge your pace from there.) It may take you a few goes at it to learn what a consistent pace is. If you find you get too tired, slow down, or walk, but continue going for the full five minutes. Make sure at least one footstep over the end line on each lap. The more laps you complete the fitter you are.

How many 20m laps can you complete in 5 minutes?



Discipline is doing
what needs to be
done, even if you
don't want to do it.

18. 20m run scoring tables

These three scoring tables will enable you to rate your performance against other people.

1. Scoring table for regular folks

20m run		Laps									
Men	<22	22	24	26	28	30	32	34	36	38	40
Women	<20	20	22	24	26	28	30	32	34	36	48
Points	0	1	2	3	4	5	6	7	8	9	10

2. Scoring tables for serious athletes and sports people

20m run		Laps									
Laps	Men	<44	44	46	48	50	52	54	56	58	60
Laps	Women	<40	40	42	44	46	48	50	52	54	56
Points		0	2	3	4	5	6	7	8	9	10




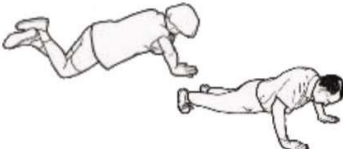

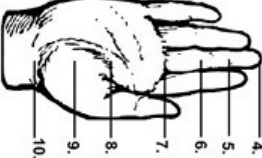



3. Percentage tables for all comers.

REGULAR FOLKS FITNESS						
LAPS	POINTS			LAPS	POINTS	
	Men	Women			Men	Women
11	0	0		31	56	62
12	12	12		32	57	66
13	13	13		33	58	70
14	14	14		34	59	72
15	15	15		35	60	74
16	16	16		36	64	76
17	17	17		37	68	78
18	18	18		38	72	80
19	19	19		39	76	82
20	20	20		40	80	84
21	22	22		41	82	86
22	24	24		42	84	88
23	26	26		43	86	90
24	28	28		44	88	95
25	30	30		45	90	100
26	35	35		46	92	
27	40	45		47	94	
28	45	50		48	96	
29	50	55		49	98	
30	55	60		50	100	

ELITE FITNESS		
LAPS	POINTS	
	Men	Women
40	70	72
41	72	74
42	74	78
43	76	82
44	78	86
45	80	88
46	82	90
47	84	91
48	86	92
49	88	93
50	90	94
51	91	95
52	92	96
53	93	97
54	94	98
55	95	99
56	96	100
57	97	
58	98	
59	99	
60	100	

I can give you
the program
but I can't do
it for you.
Kenneth Cooper

19. Universal fitness test – for regular folks

<p>1. Body composition. How close are you to your ideal weight? You can estimate the number of kilograms over your ideal weight or use percent body fat..</p>	
<p>2. Lower body strength – squat How many squats can you until exhaustion? Your bottom must go lower than the crease at the back of your knees. If you've got sore knees either don't proceed or proceed with caution. Suggest a 3cm heel raise.</p>	
<p>3. Front of body strength – sit-ups to exhaustion. Arms crossed and hands clasping alternate shoulders: knees bent. There is evenly divided conjecture about whether it is safe to do situps with feet held. I believe the exercise is safe.</p>	 If it hurts, stop doing it
<p>4. Upper body strength – press-ups to exhaustion. If you've got painfully sore shoulders either don't do this exercise or proceed with caution – and don't do too many.</p>	
<p>5. Hamstring flexibility - sit and reach Sitting on the floor, with feet outstretched in front of you, see how far down toward or past your toes you can reach with your fingers. Keep the back of your knees flat on the floor.</p>	 
<p>6. Buttock flexibility - ability to sit up straight with legs crossed With legs crossed and hands clasped behind your back, see if you can sit up straight without falling over backwards.</p>	
<p>7. Shoulder function Stand with heels and back against the wall, arms and wrists vertical in the 'surrender position'. The further they are away (in cms) the lower the score.</p>	
<p>8. Aerobic fitness - 20m laps in 5 minutes How man 20m laps can you complete in 5 minutes. One foot must go past the line each time you turn.</p>	

20 ... Universal fitness test scoring table

1. Body composition: how close are you to your ideal weight?

Current weight Ideal weight Percent body fat

	Kg over ideal wt	>25	<25	<20	<15	<10	<7	<4	<2	
	% fat men	<40	<40	<36	<32	<29	<26	<23	<20	
	% fat women	<50	>50	<46	<42	<39	<36	<33	<30	
		3	4	5	6	7	8	9	10	

2. Lower body strength – squats – until exhaustion #.....

Squat so your bottom goes down to at least the crease in the back of your knees and stand up straight with legs fully extended.

>6	6	8	10	12	14	16	18	20	22	24
0	1	2	3	4	5	6	7	8	9	10

3. Front of body strength – situps feet held - until exhaustion #.....

Men on toes, women on front of thighs.

>6	6	8	10	12	14	16	18	20	22	24
0	1	2	3	4	5	6	7	8	9	10

4. Upper body strength – press-ups – until exhaustion #.....

Men on toes, women on front of thighs.

>6	6	8	10	12	14	16	18	20	22	24
0	1	2	3	4	5	6	7	8	9	10

5. Hamstring flexibility – sit and reach

Sitting on the floor with feet outstretched in front of you, see how far down toward, or past your toes you can reach with your fingers. Keep your legs straight, back of knees on the floor.

Can't touch	Fingers			Palm			Wrist
0	4	5	6	7	8	9	10

6. Buttock Flexibility – ability to sit up straight, legs crossed, hands clasped behind back.

Right leg under	Big fail	Nope	Almost	Just	Good	Perfect
0	1	2	3	4	5	

Left leg under	Big fail	Nope	Almost	Just	Good	Perfect
0	1	2	3	4	5	

Ttl

7. Shoulder function - stand with eels and back against the wall, arms and wrists vertical in the 'surrender' position. The further they are away, from the wall (in cms) the lower the score.

>15	15	13	11	9	7	5	3	2	1	Flat
0	1	2	3	4	5	6	7	8	9	10

8. Aerobic fitness – 5 minute, 20m lap run. Laps

Men	<22	22	24	26	28	33	32	34	36	38	40
Women	<20	20	22	24	26	28	30	32	34	36	38
Points	0	1	2	3	4	5	6	7	8	9	10

X 3

If you want to be fit and healthy, exercise like fit and healthy people exercise! **TOTAL**

21. Elite fitness test – for fit people and elite force personal

The Elite Fitness Test has the same tests as the Universal Fitness Test – only with higher standards.

1. Body composition: how close are you to your ideal weight?

Current weight Ideal weight Percent body fat

	Kg over ideal wt	>25	<25	<20	<15	<10	<7	<4	<2
	% fat men	26	<26	<34	<22	<20	<18	<16	
	% fat women	>34	<34	<32	<30	<28	<26	<24	
		0	5	6	7	8	9	10	

2. Lower body strength – squats – until exhaustion #.....

Squat so your bottom goes down to at least the crease in the back of your knees and stand up straight with legs fully extended.

<35	35	38	41	44	47	50
0	5	6	7	8	9	10

3. Front of body strength – situps feet held – until exhaustion #.....

Men on toes, women on front of thighs.

<35	35	39	41	44	47	50
0	5	6	7	8	9	10

4. Upper body strength – press-ups – until exhaustion #.....

Men on toes, women on front of thighs.

>35	35	38	41	44	47	50
0	5	6	7	8	9	10

5. Hamstring flexibility – sit and reach

Sitting on the floor with feet outstretched in front of you, see how far down toward, or past your toes you can reach with your fingers. Keep your legs straight, back of knees on the floor.

Can't touch toes	Fingers			Palm			Wrist
0	4	5	6	7	8	9	10

6. Buttock Flexibility – ability to sit up straight, legs crossed, hands behind back.

Right leg under	Big fail	Nope	Almost	Just	Good	Perfect
0	1	2	3	4	5	

Left leg under	Big fail	Nope	Almost	Just	Good	Perfect
0	1	2	3	4	5	

Ttl

7. Shoulder function – stand with heels and back against the wall, arms and wrists vertical in the 'surrender' position. The further they are away, from the wall (in cms) the lower the score.

>15	15	13	11	9	7	5	3	2	1	Flat
0	1	2	3	4	5	6	7	8	9	10

8. Aerobic fitness – 5 minute, 20m lap run. Laps

Men	<45	45	47	49	51	53	55
Women	<43	43	45	47	49	51	53
Points	0	5	6	7	8	9	10

X 3

If you want to be fit and healthy, exercise like fit and healthy people exercise!

TOTAL



Modern medicine is a wonderful thing, but there are two problems:
people expect too much of it, and too little of themselves.
Don Ardell

