The only 10 exercises you'll ever need

'A refreshing, innovative and powerful roadmap to healthy ageing through strength building'

Dr. Kelly Starrett and Juliet Starrett, co-authors of the *New York Times* Bestseller *Built to Move*

Stronger

How to build strength: the secret to a longer, healthier life

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I wrote this book with the sole aim of democratising strength training. I have attempted to walk the middle ground by sharing effective, friendly, reliable and hopefully entertaining information. The process was informed by the strength journeys of the inspirational individuals I have worked with, as well as my own observations and research into how to win at ageing.

To this end, I urge you to read this book as it has been written, from beginning to end. That way, you will learn the important lesson of 'why' before tackling the 'what', and will be far more likely to commit to a lifelong journey towards a stronger, independent future.

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Introduction

One of my most valuable life lessons was given to me by a patient with whom I worked in the last five years of her life. Joy was tall, lean and full of energy, with a fierceness of spirit that shone out of her eyes. She was interested in everything and everyone.

'I have been dancing all my life and need you to help me continue' were her first words to me. She was 88 and I had never heard a cooler opener!

Over the next five years as Joy's osteopath, I would see her every six weeks to help with pain or mobility issues and give suggestions on strength-maintaining activity. Joy would bring me books and recommend podcasts and films. She never failed to teach me something. She was still interested in life, making new friends and learning until the day she died aged 93. Joy passed away peacefully in her own bed, with no illness, no medication or need for care, whilst living the life that she wanted. I have no doubt she had interesting plans for the very day that turned out to be her last. Being active until she died was hard evidence of what I had studied and continue to observe in my work on healthy ageing:

Strength is the magic bullet for a full, enjoyable and independent life right up to our last day on this planet.

Joy had a genetic pedigree of family longevity, a little luck, a positive mindset and commitment to lifelong regular exercise and learning. However, first and foremost Joy had built and maintained the neuromuscular system that literally propelled her through the day and kept her immune system working well. She was a strong woman in every sense and showed me that vitality and power is possible for everyone, no matter what age they start strengthening.

As an osteopath, I have worked to help individuals with pain and arthritis, and international sports teams with conditioning and medical advice. I have also worked on UK public health projects, and with think

tanks on wellbeing in ageing. For many years, I served as a fire service physical education officer and I am a lifelong fitness enthusiast. My personal motivation to maintain strength has come from my lived experience following an injury that ended my career as a firefighter, when it proved an effective part of my recovery, and my own journey into middle age.

As I was to find after the injury that changed my life, recovery is not always a case of surgery, rehab and then return to work. The mental fall-out of losing my identity, so wrapped up within my firefighter's uniform, proved to be as persistent as the back and leg pain that still lingers today. It would take five years before I was able to manage my pain to the point that I did not need medication. What I discovered was that prolonged exposure to pain was not only draining me physically but also damaging every aspect of my life.

Although it is frustrating to be told that pain is 'all in your head' when you feel it very acutely in your body, to a certain extent it is true. Pain lives in our brains along with our consciousness; a bit like a nuisance neighbour who you wish would move away. When pain affects our strength and ability to move, this nuisance neighbour becomes louder and more annoying until they drown out all other thoughts.

It was my injury that changed my entire outlook on strength, movement and exercise. Far from being merely an element of physical performance, I found that as I slowly regained my strength, my pain changed for the better. I was much less aware of that annoying neighbour. I realised that having strength was just as intrinsic to my wellbeing as eating or breathing.

What I learned transformed how I help people invest in their future health and now I want to pass that knowledge on to you, so that you can secure yours. I had become an expert in older-age strength only to realise that middle age (for our purposes, the years between 35 and 65), was in fact the key period to influence it meaningfully. However, I also understood that I was in the minority, because very few people have any idea that strength training is the single most important factor affecting

older-age health. Fewer still realise that middle age is a key life stage in which the quality of our future health can be determined.

Joy, alongside many others I have seen flourish in older age, had built up her strength before and into middle age. With my support she had continued to do this until the day she died. During our sessions, I would suggest an everyday activity that would keep her legs strong or help with balance, such as holding a static squat position when in her 'little room'. We would laugh at this, but it was a reminder that leg strength work can be done anywhere, at any time – even if it happens to be in the smallest room in the house!

Can you stand up from sitting in a deep or low chair without using your hands?

- Can you stand on one leg whilst putting a sock on the other foot?
- Do you find it easy to climb over stiles or fences if out walking?
- Do you find it easy walking down staircases or steps?

If you have answered no to any of the questions above, you should consider improving your thigh and hip strength. If you answered yes to all the questions – great! Let's learn how to keep things this way!

Keeping stronger for longer

So why is strength so important? Well, I am not alone in believing that the *stronger* we are, the *longer* we live with our independence and health intact. A decade-long observational study found those with the lowest muscle mass and strength levels had around double the mortality risk compared to the control group. Not surprisingly, they also found that

those with low strength and muscle mass, plus a combination of diabetes, high blood pressure and obesity, were found to have over three times the risk of mortality.[1] I believe that by consistently working on our long-term muscle mass and strength, whilst maintaining healthy weight, we are highly likely to enjoy better quality of life and health in old age. If we also have good cardiovascular fitness, then the odds of enjoying versus enduring our older age are going to keep increasing.

The decline in muscle and strength due to ageing has been a preoccupation of humans since early Greeks and Romans first wrote despairingly about the loss of youthful vigour.[2] In the 20th century, the term 'sarcopenia' (from the Greek 'sarx' or flesh, and 'penia' or loss) was coined to denote this decline and the associated frailty it causes.

Simply put, being frail means we lack the reserves to recover from illness, injury or other life events that would normally not impact our health. Frailty makes us more vulnerable to falls, fractures and physical decline, often leading to admission to care settings and even premature death.

The good news is that frailty can be improved by prioritising the preservation of skeletal muscle strength for older age. But before we relax, thinking we can delay getting stronger until some future time, be warned – if we leave it too late, we could miss our chance. It is during middle age that we still have a window of responsiveness to exercise that can help to significantly improve our long-term muscle mass, strength and power. Furthermore, it is in middle age that adaptations leading to sarcopenia and frailty start, subtly at first and then more noticeably. It is true that we can build some strength in our sixties, seventies and even eighties, but it'll be much harder and for some, impossible. When discussing this subject with Rachel Copper, professor of epidemiology within the age research group at the University of Newcastle, she suggested a *cumulative* beneficial effect from long-term strength training. Similar to a pension plan, it seems the sooner in life we start strength training, the better!

There are some factors affecting our strength that we can't change. All humans experience hormonal decline, typically starting in our mid-

thirties, that we can do little to influence. But we also lose strength in middle age due to general inactivity, ineffective strength training or through focusing too heavily on non-strengthening exercises.

It is these last three factors that are our focus, because that's what we can control. If we engage in strength training at the right time in our lives, we can transform our future health. We will be much less likely to become frail, need care, get injured or die before our time due to illness or as a consequence of falling.

Why now?

If you are reading these words and feel that this does not apply to you because you are 30 or 40, or because you are exercising regularly, it's time to think again. In my experience, most of us feel that this information is irrelevant to us. Who cares about what happens in 30 years' time? This mindset is understandable, and I certainly was guilty of it myself, especially as I was a regular participant in a broad spectrum of activities such as running, swimming, cycling and hiking. I thought I had exercise covered, and certainly hadn't considered my own mortality! However, what I was seeing in my clinic and in my research told a different story. I realised I was as much at risk of later-life frailty as anyone else.

Many of us may have gone to a gym in our late teens and twenties to build muscle and strength. But the number of people in their forties, fifties or sixties doing the same make up a small percentage of the population. Equally worrying is the fact that most people, of any age, don't know and haven't been educated about strength. Think about it: what do you most associate with strength training? Younger people in expensive-looking sports gear? Perhaps uninviting gyms, awash with protein shakes and loud music? Worse still, sweaty muscle-bound types taking selfies to post later? Social media and advertising have perhaps helped to reinforce the myth that strength training is the preserve of the young. But this is simply not true, and my mission is to bust this myth, and democratise strength for one and all.

In the past I have worked on steering groups focused on initiatives

to get older people and those in care homes to be more active. I have seen the positive effects that engaging and supporting older age groups or those with long-term conditions can have. However, research and my own experience in clinic suggest that older age is not the best time to start building strength. Unfortunately, if an older person stops following the strength advice they were given, any improvements will be very short-lived. Moreover, short-term exercise interventions can do more harm than good. It seems obvious to me that anything achieved quickly in terms of building strength can be lost just as swiftly. The same pattern is seen with rapid weight loss and crash dieting. It is far better to allow your body to become stronger over the long term if that strength is to be maintained. One of the UK's leading campaigners for optimal health in older age, Professor Sir Muir Grey, is on the same page. He argues that major health problems from biological ageing do not appear until the age of 90 or older, and many signs that are commonly attributed to ageing, such as weakness, stiffness, shortness of breath and fatigue, are in fact due to loss of fitness. I wholeheartedly agree. The best prescription for staying young is to make an early investment in your strength and fitness, taking little steps every day to delay the signs of ageing for as long as possible.

We need to give ourselves the time to become fluent in strength, which, like learning a language, can take years. But once we have it mastered, it will literally act as a font of youth, or more aptly, a reservoir.

Your strength reservoir

Think of your personal strength as a beautiful mountain reservoir. If the reservoir is full, it has the capacity to feed your needs: to move, to maintain good posture, to avoid trips and falls, and underwrite your immune system. This is a useful metaphor since our skeletal muscle also acts as a real physical reservoir of amino acids, stored within our muscle proteins. There are 20 types of amino acids, nine of which we get from our food. Proteins are made up of chains of amino acids that come together to execute the individual task in hand. At an everyday level, it

is our amino acids that allow our bodies to conduct their housekeeping duties. These include the growth and repair of muscle and other body tissues, including tendons and ligaments, the making of antibodies, hormones and enzymes that are essential for human life and the maintenance of healthy skin, nails and hair. The reservoir of amino acids contained within our skeletal muscle can also be drawn on as an energy source.

As we age, the level of the reservoir will naturally begin to drop, but can be topped up via our exercise and lifestyle choices, which will prevent us from becoming frail.

By keeping our reservoir topped up via strength training, we are more likely to be able to respond to whatever life throws at us – whether that be illness, accident or unforeseen immobility due to surgery. It will help us maintain our ability to move and in turn increase the likelihood of living independently in older age.

Something as simple as the ability to perform an own body weight squat is one of the main predictors of whether we will need care in later life. A squat is the main movement required to get on and off the toilet independently, the ability to get in and out of bed or navigate a staircase. What seem like everyday activities to most of us might one day take on life-changing significance. So it's a good idea to occasionally test yourself in this movement either on a chair, or anything else you tend to sit on every day!

Bonus feature: maintaining strength in this movement will also protect our bones, making them less likely to fracture in an accident. It also reduces the chances of falling as our balance will benefit.

Lower-body strength check

Are you sitting comfortably? Then let's begin with a lower-body strength check.

- From your seated position and without using your arms, try standing up using only your thigh muscles.
- If this is too easy, make it harder by trying the same movement from a lower chair.
- You can further challenge yourself by trying to stand up using only one thigh, and then lastly standing up from a seated position on the floor (again, without using your arms).
- If the chair test is not possible for you without the aid of your arms, you can make things easier by adding cushions to the seat of your chair until you can progress to the examples above as you become stronger.
- For every version of this movement, try standing and then slowing the lowering phase for the count of 4 seconds. This lowering under control is called an *eccentric* contraction and is gold dust for older-age strength. We will be discussing this and what other types of muscle contractions can offer later in the book.

Strength vs exercise

Let's face it, we've all been guilty of avoiding exercise at some point. Perhaps we've had an exhausting week or it just doesn't fit into a busy schedule. That said, you might still be surprised to hear that in the UK we spend more time on the toilet than engaged in exercise.[3]

When we dig deeper, we see that those who *are* participating in exercise tend to focus on aerobic-type activity such as swimming, cycling or running. Historically this was, and continues to be, driven by fitness messages focused on getting outside and 'getting a sweat on'. This has great merit in terms of burning calories, maintaining healthy weight and preventing diabetes and heart disease. But despite the benefits, aerobic-type activity is not enough to offer maximal protection

from things like frailty and osteoporosis in older age – unless it is combined with the magic ingredient: regular strength training.

I believe that an overemphasis on aerobic-type activity has had a negative consequence on the strength levels of nations around the world. It has led to what I refer to as 'strength hesitancy', which was confirmed by a recent survey in the UK that found that only 7% of men and 4% of women achieved the recommendations for strengthening activity.[4] This in spite of the fact that the National Health Service and the World Health Organization both recommend that adults strength train all major muscle groups twice a week.[5] The lack of strength across an individual's entire life can have devastating effects not only on their quality of life in older age, but also the wider community who support them.

The trick is maintaining a balance between the two. We need to value cardiovascular *and* strength training, and devise a way to incorporate both into our exercise plans. The last thing we want is for people to pivot to only strength training and create a new 'sweat hesitancy'. We need to get a sweat on AND build our strength up!

Don't stop moving

My epiphany in my own strength journey came from learning that the key to staying strong is never to give up.

I am sure we can all think of people, family or colleagues perhaps, who were once known for being fit, strong and capable. Perhaps as a young person we aspired to be as accomplished as them one day. Such a moment came for me when, at the age of 18, I first met my recruit fire instructor station officer. He was a no-nonsense officer who had seen and done it all in the fire service. He was able to bench press 300 pounds and run a marathon in under three hours. But his party trick was to climb, hand over hand, up a 30-foot fireman's pole using only his upper body and with his legs held at a right angle. He was 45 years old at the time.

For many years, I believed that, like my recruit station officer, being fit and strong at one point in my life would protect me in older age. I was in fact buying into one of the most common exercise myths. I have since