

# DESK BREAKER

## 15 MINUTE HOME WORKOUT ROUTINES

- ✓ COUNTERACT THE RAMIFICATIONS OF SITTING
- ✓ DEVELOP SUSTAINABLE WORK AND STUDY CYCLES
- ✓ PREPARE YOUR BODY TO ENGAGE IN PHYSICAL ACTIVITY & FORMAL TRAINING REGIMES

*By*

*CHRISTIAN VASSALLO BSc, ASCC*

*This resource is dedicated to all my family, close friends and colleagues who dedicate a substantial amount of their lives in front of a screen or text book, with the noble purpose of growing in knowledge and accomplishing personal and professional endeavours.*

*It is my hope that this resource makes some small contribution in helping them become more productive so that they may continue to pursue these same endeavours without hindrance.*

# INTRODUCTION



WELCOME TO...

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**DESK BREAKER**

The following tasks form an inextricable part of daily life:

Reading

Studying

Eating

Commuting

T.V. and Movie Watching

Work Projects

Email Correspondence

Formal & Informal Meetings

Socialising

One common theme that appears here is that these activities are more often than not carried out whilst sitting. What's more, they are often performed in prolonged and concentrated bouts. Thus, one may end up with a typical day that resembles something akin to a chair-enticing environment:

### WEEKDAY



Breakfast



Commute



Work



### WEEKEND



Commute



Dinner



T.V.



Breakfast



T.V.



Reading



Internet



Exercise



Socialise

## IS SITTING REALLY THAT BAD FOR YOU?

It should make intuitive sense that people who spend a lot of time sitting (sedentary behaviour\*) expend less energy than those of us who are physically active. This in turn places such people at greater health risk relative to those who sit less. Recent research\*\* suggests that a dose-response relationship exists between the time one spends sitting and the risk of all-cause mortality<sup>1</sup>. Prolonged sitting has also been linked to the development of metabolic syndrome – a trio of conditions that include obesity, increased blood pressure (hypertension) and diabetes, leading to increased risk of cardiovascular disease mortality<sup>2,3,4</sup>.

Why all the fuss? Critically, this has been shown to be **independent** of the time one spends in moderate to vigorous physical activity. In other words, the consequences of sitting too much apparently cannot be mitigated by exercising more. Additionally, after controlling for body mass, the health risks still remain the same, indicating that the risks are just as high even for lean or otherwise physically active individuals. Although the underlying pathologies are yet to be established, this may be partly attributable to physiological mechanisms at the skeletal muscle level vs. body fat per se.

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**All things being equal, the one who sits less is likely to be ‘healthier’ than the one who sits more.**

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\* This excludes sleeping, which is health enhancing.

\*\* Due to Sedentary Physiology being an emerging field, studies are largely observational (cross-sectional epidemiological) and thus all risks should be interpreted as associative, at least until greater strength of evidence is available.

# Don't just sit there!

We know sitting too much is bad, and most of us intuitively feel a little guilty after a long TV binge. But what exactly goes wrong in our bodies when we park ourselves for nearly eight hours per day, the average for a U.S. adult? Many things, say four experts, who detailed a chain of problems from head to toe.

REPORTING BY BONNIE BERKOWITZ; GRAPHIC BY PATTERSON CLARK

## ORGAN DAMAGE

### Heart disease

Muscles burn less fat and blood flows more sluggishly during a long sit, allowing fatty acids to more easily clog the heart. Prolonged sitting has been linked to high blood pressure and elevated cholesterol, and people with the most sedentary time are more than twice as likely to have cardiovascular disease than those with the least.

### Overproductive pancreas

The pancreas produces insulin, a hormone that carries glucose to cells for energy. But cells in idle muscles don't respond as readily to insulin, so the pancreas produces more and more, which can lead to diabetes and other diseases. A 2011 study found a decline in insulin response after just one day of prolonged sitting.

### Colon cancer

Studies have linked sitting to a greater risk for colon, breast and endometrial cancers. The reason is unclear, but one theory is that excess insulin encourages cell growth. Another is that regular movement boosts natural antioxidants that kill cell-damaging — and potentially cancer-causing — free radicals.

## TROUBLE AT THE TOP

### Foggy brain

Moving muscles pump fresh blood and oxygen through the brain and trigger the release of all sorts of brain- and mood-enhancing chemicals. When we are sedentary for a long time, everything slows, including brain function.

### Strained neck

If most of your sitting occurs at a desk at work, craning your neck forward toward a keyboard or tilting your head to cradle a phone while typing can strain the cervical vertebrae and lead to permanent imbalances.



Proper alignment of cervical vertebrae

### Sore shoulders and back

The neck doesn't slouch alone. Slumping forward overextends the shoulder and back muscles as well, particularly the trapezius, which connects the neck and shoulders.

## BAD BACK

### Inflexible spine

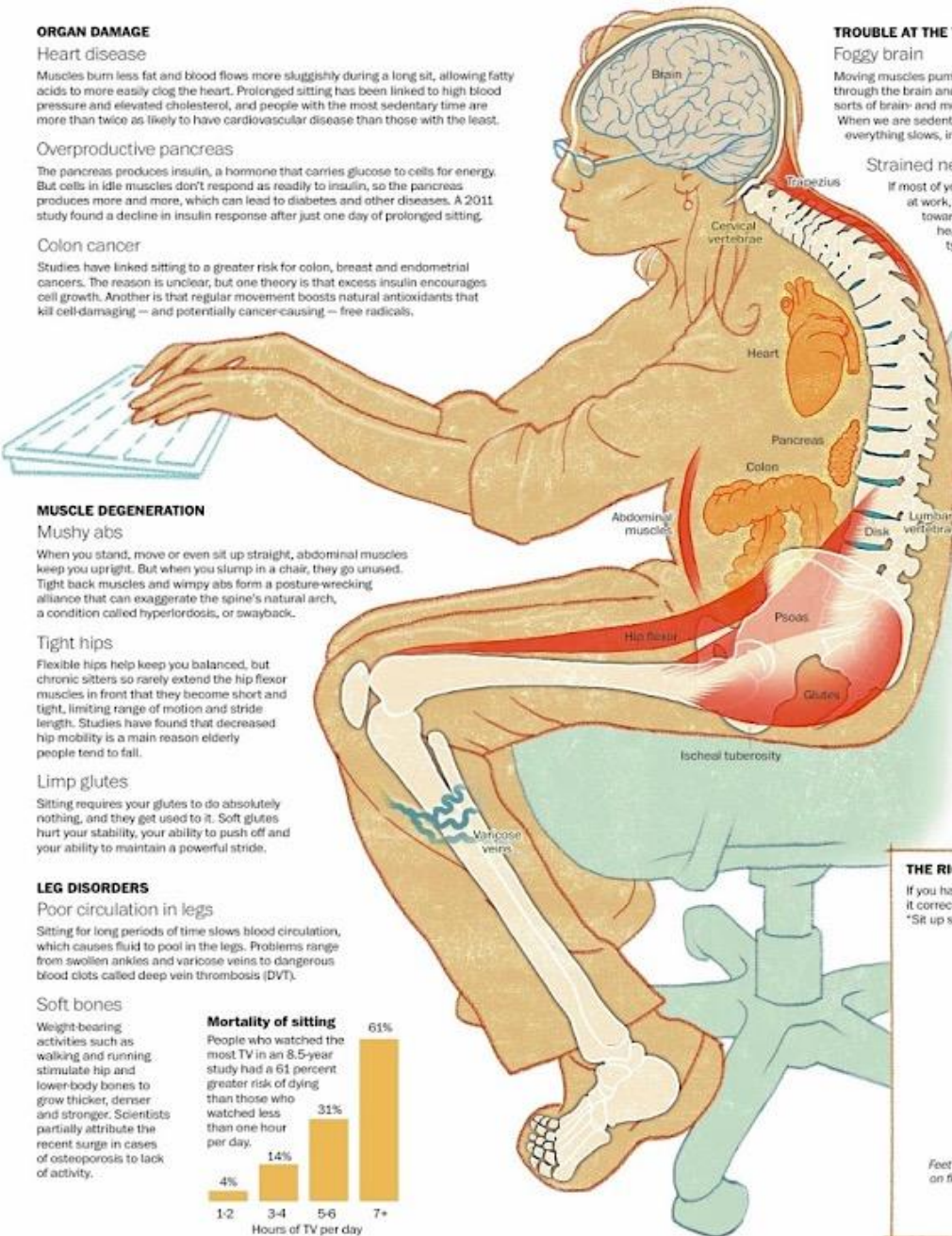
Spines that don't move become inflexible and susceptible to damage in mundane activities, such as when you reach for a coffee cup or bend to tie a shoe. When we move around, soft disks between vertebrae expand and contract like sponges, soaking up fresh blood and nutrients. When we sit for a long time, disks are squashed unevenly and lose sponginess. Collagen hardens around supporting tendons and ligaments.



Lumbar region bowed by shortened psoas

### Disk damage

People who sit more are at greater risk for herniated lumbar disks. A muscle called the psoas travels through the abdominal cavity and, when it tightens, pulls the upper lumbar spine forward. Upper-body weight rests entirely on the ischial tuberosity (sitting bones) instead of being distributed along the arch of the spine.



## MUSCLE DEGENERATION

### Mushy abs

When you stand, move or even sit up straight, abdominal muscles keep you upright. But when you slump in a chair, they go unused. Tight back muscles and wimpy abs form a posture-wrecking alliance that can exaggerate the spine's natural arch, a condition called hyperlordosis, or swayback.

### Tight hips

Flexible hips help keep you balanced, but chronic sitters so rarely extend the hip flexor muscles in front that they become short and tight, limiting range of motion and stride length. Studies have found that decreased hip mobility is a main reason elderly people tend to fall.

### Limp glutes

Sitting requires your glutes to do absolutely nothing, and they get used to it. Soft glutes hurt your stability, your ability to push off and your ability to maintain a powerful stride.

## LEG DISORDERS

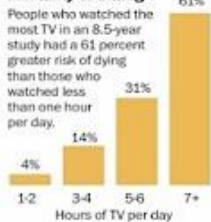
### Poor circulation in legs

Sitting for long periods of time slows blood circulation, which causes fluid to pool in the legs. Problems range from swollen ankles and varicose veins to dangerous blood clots called deep vein thrombosis (DVT).

### Soft bones

Weight-bearing activities such as walking and running stimulate hip and lower-body bones to grow thicker, denser and stronger. Scientists partially attribute the recent surge in cases of osteoporosis to lack of activity.

### Mortality of sitting



## THE RIGHT WAY TO SIT

If you have to sit often, try to do it correctly. As Mom always said, "Sit up straight."



So what can we do? The experts recommend . . .

**Sitting on something wobbly** such as an exercise ball or even a backless stool to force your core muscles to work. Sit up straight and keep your feet flat on the floor in front of you so they support about a quarter of your weight.



**Stretching the hip flexors** for three minutes per side once a day, like this:



**Walking during commercials** when you're watching TV. Even a snail-like pace of 1 mph would burn twice the calories of sitting, and more vigorous exercise would be even better.



**Alternating between sitting and standing** at your work station. If you can't do that, stand up every half hour or so and walk.



**Trying yoga poses** — the cow pose and the cat — to improve extension and flexion in your back.



## The experts

Scientists interviewed for this report:

**James A. Levine**, inventor of the treadmill desk and director of Obesity Solutions at Mayo Clinic and Arizona State University.

**Charles E. Matthews**, National Cancer Institute investigator and author of several studies on sedentary behavior.

**Jay Dicharry**, director of the REP Biomechanics Lab in Bend, Ore., and author of "Anatomy for Runners."

**Tal Amasay**, biomechanist at Barry University's Department of Sport and Exercise Sciences.

*Additional science: "Amount of time spent in sedentary behaviors and cause-specific mortality in U.S. adults," by Charles E. Matthews, et al., of the National Cancer Institute; "Sedentary behavior and cardiovascular disease: A review of prospective studies," by Earl S. Ford and Carl A. Cooperstein of the Centers for Disease Control and Prevention; Mayo Clinic.*

## INCREASING ENERGY EXPENDITURE: EXERCISE

A common form of moderate to vigorous physical activity (MVPA) is planned exercise. This usually takes place through mediums such as competitive and recreational sport as well as other activities including resistance training, running, swimming, cycling, mountain climbing and hiking.



**Energy expenditure is very good for us.**

**We need lots of it.**



## HOWEVER: EXERCISE DOES NOT CANCEL OUT THE HEALTH RISKS OF SITTING

Sitting too much cannot be compared to exercising too little. Unfortunately for us, the consequences of prolonged sedentary behaviour cannot be reversed by an hour or two of moderate to vigorous exercise.

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**Irrespective of how much or how little you exercise, irrespective of how much or how little you weigh, sitting for prolonged periods still poses an independent health risk.**

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Consider the example of an elite athlete. Though he or she may train up to 3-4 hours per day, it is still highly possible for this elite athlete to be sedentary, particularly in light of the need to rest and stay off their feet in order to facilitate training adaptations. In other words, one could describe them as an “**active couch potato**”, which may indeed come as a surprise to many. Though this represents a unique case example, it is simply to highlight the fact that we also need to draw our attention to habits in and around our exercise/training routines.

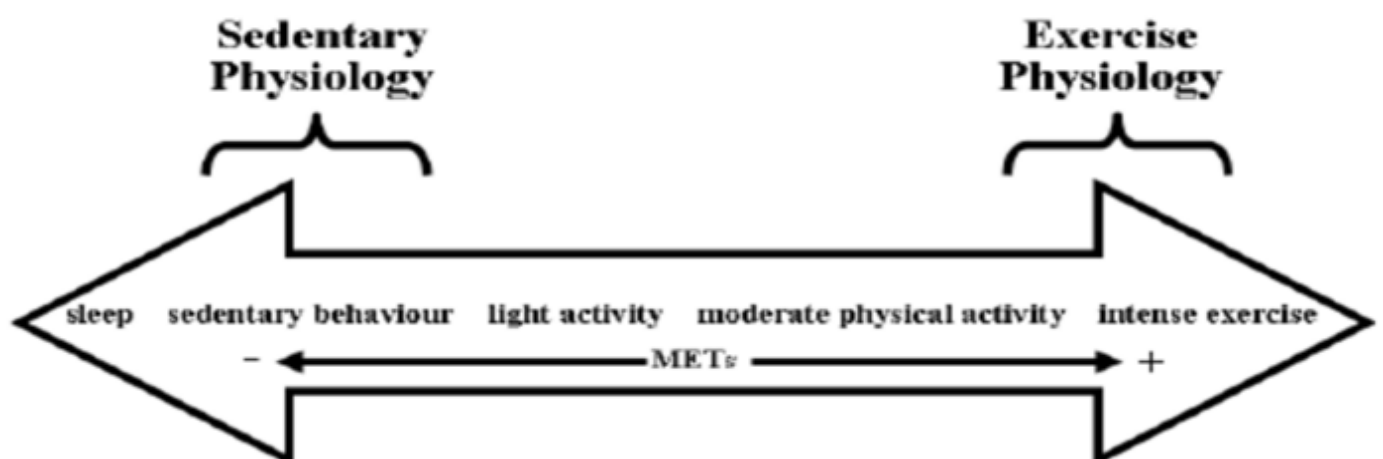


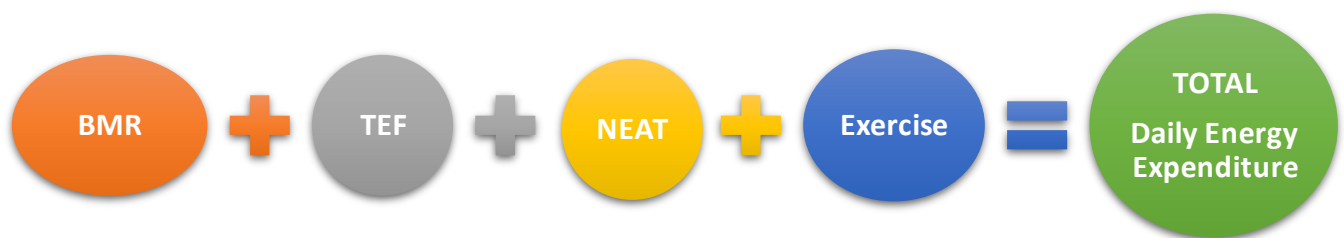
Fig. 1. The movement continuum, illustrating the different focus of sedentary physiology and exercise physiology. METs, metabolic equivalent tasks.<sup>5</sup>



## INCREASING NEAT TO COMBAT SEDENTARY TIME

Another, often underestimated form of energy expenditure is non-exercise activity thermogenesis (NEAT). NEAT<sup>6</sup> involves activities ranging from household chores (e.g. cleaning, gardening) to non-conventional activities such as running for the bus, standing and fidgeting. It encapsulates all the energy expended for everything we do apart from sleeping, eating or planned exercise. It would be prudent to mention that by simply increasing NEAT, sedentary (and therefore sitting) time will likely decrease – the two are somewhat inversely proportional to each other as you will have less time in the day to sit or lay down.

## Components of Energy Expenditure



- Largely related to person's active tissue mass. Energy cost for maintaining vital bodily functions e.g. thermoregulation, breathing. Accounts for 60-80% of energy expenditure.

- Metabolic cost of dealing with the consumption and digestion of food.

- Energy expended for everything we do **apart** from sleeping, eating or planned exercise e.g. cleaning, standing, fidgeting. Most variable component of total energy expenditure, ranging from 300-2000 kcals/day.

- Physical activity that is **planned**, structured, repetitive, and results in the improvement or maintenance of one or more facets of physical fitness.

Broad & Cox (2008)

## THE SOLUTION?

To make it clear, I am not claiming to have **the** solution.

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**Ultimately, the best solution for you is one that you can adhere to and which subsequently instigates long-term behaviour change.**

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There are numerous interventions being investigated at the moment in the research community. The majority of these consist of encouraging work places to invest in standing desks and cultivating an environment that is conducive to sitting less.

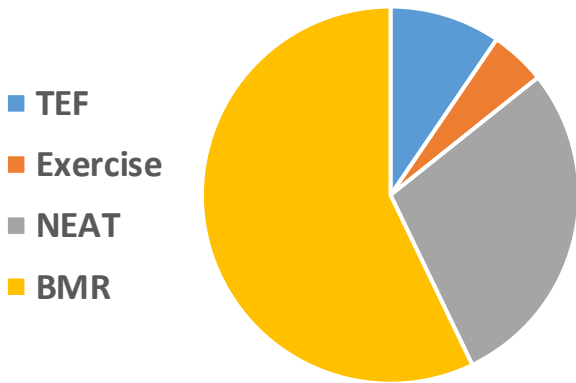
Whilst most of these interventions will be substantiated by some robust scientific evidence, this resource has not yet been put through such scientific rigour.

Nevertheless, I have endeavoured to base this on sound principle and theory, combining it with my own implicit coaching intuition. It is my intention that this resource serves the purpose of breaking up your sedentary time, but not only that – I anticipate that it will also enhance your productivity **during** your sedentary time.

## PHYSIOLOGY OF EXERCISE:

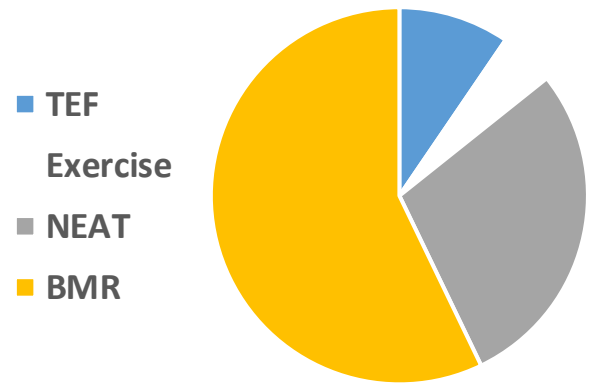
### WHAT HAPPENS IF I STOP EXERCISING?

#### Regular Exerciser



**Active + Non-Sedentary**

#### Exercise Deficient

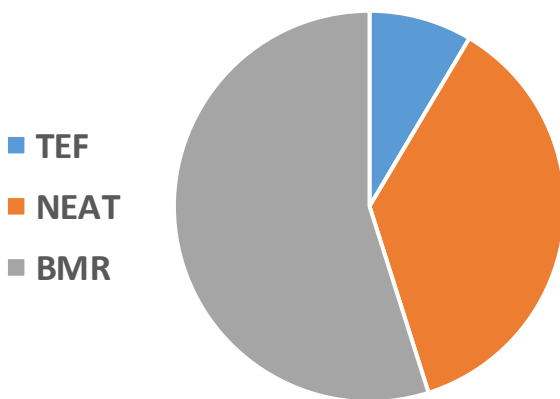


**Inactive + Non-Sedentary**

## PHYSIOLOGY OF INACTIVITY<sup>8</sup>:

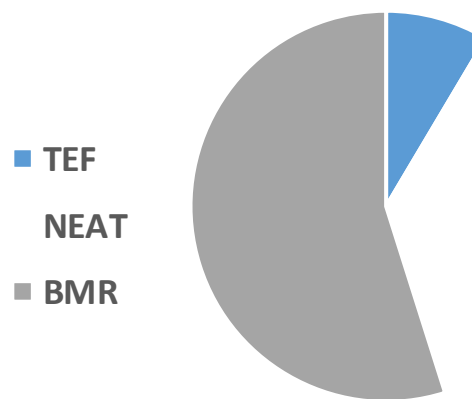
### WHAT HAPPENS IF MOST OF MY DAY IS SPENT SITTING?

#### Normally High NEAT



**Non-Sedentary**

#### NEAT Deficient



**Couch Potato (Sedentary)**

Hamilton et al. (2008)

# THE ROUTINE

## OVERVIEW

Interrupting sitting time is critical<sup>9,10</sup>. The more regular our breaks, the better. Eight hours of interspersed sitting do not have the same consequences as eight hours of continuous sitting. The sweet spot lies somewhere between establishing a flow of rhythm in order to produce the work required (or to digest what one is reading), whilst on the other hand not going gung-ho and suffering burn-out in an attempt to accomplish everything in one sitting, quite literally.

We possess the inherent ability of self-determination. It therefore follows that we are a sum total of our choices. We can exercise the choice to break up our sitting time and in turn develop a sustainable rhythm, or not. Anecdotally, since making the conscious choice of incorporating this routine into my own day, I have found concentration levels during subsequent work/study cycles to be markedly better.

One final point I would like to reiterate – these routines should **not replace** your own exercise routine. The remit behind this resource is to:

- i) Counteract prolonged sitting
- ii) Enhance focus during sitting time
- iii) Optimally prepare your body to undergo the rigours of your actual exercise routine

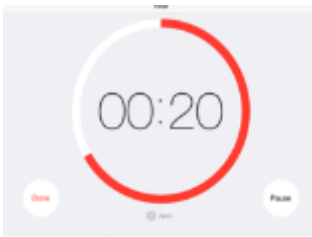
With regard to the latter, it just so happens that many of us are ill-prepared to participate in many of the exercise activities/sports we choose to engage in. This is by and large a consequence of our ubiquitous sedentary culture. Referring back to

the figures on page 11, it should be our goal to mould our “energy expenditure profile” to resemble that of the top left (Active + Non-Sedentary).

Having said this, if, on the other hand this is likely to be your only source of planned physical activity, then that’s fantastic and I would like to welcome you onto this journey! In this case, each of the routines can be combined together in a circuit-like manner – the variations are endless and will only be limited to one’s creativity. Combining 2 routines will take approximately 20-30 minutes depending on the number of sets that are performed.

## WHAT YOU WILL NEED

### Essentials



Countdown Timer/Stopwatch



Lacrosse/Hockey Ball



Foam Roller

### Optional



Minibands



Ab-Wheel



Swiss Ball

## HOW IT WORKS

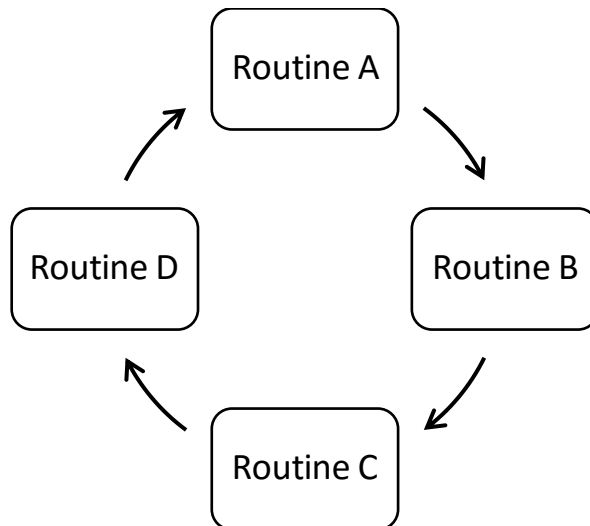


Fig. 2. Cyclical process depicting the sequential manner through which one should perform the four different routines.

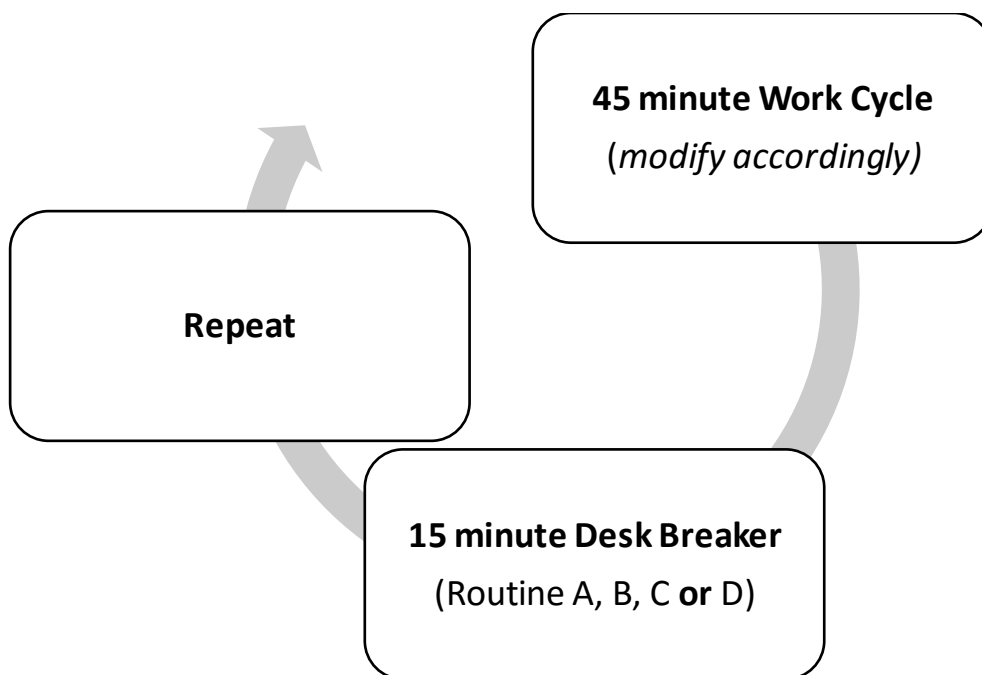


Fig. 3. Study Cycle and Desk Breaker Process. For every subsequent break, move onto the next routine.

You should follow these in chronological/alphabetical order. If in the case you only manage to do a single routine on one day (e.g. Routine A), simply start the following day's Desk Breaker with the routine that follows (e.g. Routine B).

## DESK BREAKER ROUTINE

The fifteen-minute Desk Breaker is split into two main components:

1. Restore
2. Recruit

The rationale behind these two methods is to counteract the physiological changes that are induced during sitting. We know that sitting results in rapid changes in skeletal muscle, namely reduction in muscle triglyceride uptake and increased insulin resistance – all bad things.

### **Restore (10 minutes)**

I have chosen the term *Restore* so as to imply restoring lost range of motion.

Specifically, with a focus on improving soft tissue quality, posture and overall muscle function. You shall start with a form of self-massage using a foam-roller or a lacrosse/hockey ball. This will be followed by a mobility exercise or static stretch.

This sequence will target **Lower** body first, followed by **Upper** body.

### **Recruit (5 minutes)**

The next component, *Recruit*, is aimed at stimulating motor unit recruitment and innervating muscles that have become ‘dormant’ during your previous bout of sitting. These exercises will also act as a corrective dose of work for addressing the muscle slack that is dominant during sitting. It will teach you correct mastery of fundamental human movements, which in turn will guide you towards motor skill competency. This component will be comprised of **two** levels. Start at level one, and once mastery is achieved and technique is maintained under fatigue, progress to



level two. Progression should be *competency* dependent and not *time* dependent. You earn the right to progress. For some exercises you may stay on level one, whilst for others you may quickly progress to level two. The sequence will generally follow this order: **Lower – Upper – Core.**

Finally, Routines A-D are specifically designed so that over the course of the week you are provided with a self-administered full body MOT. Hence, it is important that you don't just pick the exercises you like or are good at, but instead adhere to all four of the routines.

Should you wish to pass on any comments or feedback kindly email them to:  
[christian.vassallo.uk@gmail.com](mailto:christian.vassallo.uk@gmail.com).

Enjoy your energy expenditure endeavours!

Christian Vassallo



# ROUTINE A

R  
E  
S  
T  
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## LOWER

**Foam Roll**  
Quadriceps  
Duration: 2-3 mins each side



**Mobilise**  
Couch Stretch  
Duration: 1 min each side

## UPPER

**Foam Roll**  
Thoracic Spine  
Duration: 2-3 mins



**Mobilise**  
Wall-Slides in Wall-sit Position  
Kneeling T-Spine Rotations  
Repetitions: 10

## LEVEL ONE

R  
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Order	Name	Repetitions	Sets
A1	Glute Bridge	15	1-2
A2	Press-up	10	1-2
A3	Deadbug	10	1-2

## LEVEL TWO

Order	Name	Repetitions	Sets
A1	Crab Hold with Overhead Reach	5 each side	1-2
A2	Bottom-up Press-up	10-15	1-2
A3	Hollow Hold	5 x 5s holds	1-2

# ROUTINE B

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## LOWER

**Hockey or Lacrosse Ball**  
Glute and Piriformis  
Duration: 2-3 mins each side

▶

**Mobilise**  
Pigeon Stretch  
Duration: 1 min each side

## UPPER

**Hockey or Lacrosse Ball**  
Pec Minor  
Duration: 2-3 mins each side

▶

**Mobilise**  
Overhead Stick/Band rotations  
Repetitions: 20

## LEVEL ONE

Order	Name	Repetitions	Sets
<b>B1</b>	Spiderman	5 each side	1-2
<b>B2</b>	Waiter's Bow	10	1-2
<b>B3</b>	Side Plank (L+R)	30s each side	1-2

## LEVEL TWO

Order	Name	Repetitions	Sets
<b>B1</b>	Miniband Squat	15	1-2
<b>B2</b>	Singe Leg RDL	8 each side	1-2
<b>B3</b>	Feet Elevated Side Plank (L+R)	45s each side	1-2

# ROUTINE C

R  
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## LOWER

**Hockey or Lacrosse Ball**  
Tensor Fascia Latae (TFL)  
Duration: 2-3 mins each side



**Mobilise**  
TFL and Oblique Stretch  
Duration: 1 min each side

## UPPER

**Hockey or Lacrosse Ball**  
Teres Major  
Duration: 2-3 mins each side



**Mobilise**  
Lattisimus Dorsi Stretch  
Duration: 1 min each side

## LEVEL ONE

Order	Name	Repetitions	Sets
<b>C1</b>	Split Squat (L+R)	8 each side	1-2
<b>C2</b>	YTWIs	5	1-2
<b>C3</b>	Leg Lowers	8 each side	1-2

## LEVEL TWO

Order	Name	Repetitions	Sets
<b>C1</b>	SL Squat + Reach	3 each side	1-2
<b>C2</b>	Band Pull-Aparts	8	1-2
<b>C3</b>	4-point Ankle Taps	6 each side	1-2

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# ROUTINE D

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## LOWER (1)

**Foam Roll**  
Adductors  
Duration: 2-3 mins each side



**Mobilise**  
Short Adductor Stretch / Lateral Squat  
Duration: 1 min each side

## LOWER (2)

**Hockey or Lacrosse Ball**  
Calves and Shins / Sole of Foot  
Duration: 2-3 mins each side



**Mobilise**  
Calf Pumps  
Repetitions: 15 each side

## LEVEL ONE

Order	Name	Repetitions	Sets
<b>D1</b>	Miniband Walks	10 each side	1-2
<b>D2</b>	Roll-outs (Knees)	5-10	1-2
<b>D3</b>	Bear Crawl	30s	1-2

## LEVEL TWO

Order	Name	Repetitions	Sets
<b>D1</b>	BW Clams (L+R)	8-10 each side	1-2
<b>D2</b>	Roll-outs (Feet)	3-10	1-2
<b>D3</b>	Alt. Arm+Leg Raise Front Plank	30-45s	1-2

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# EXERCISE INDEX

## A1 GLUTE BRIDGE



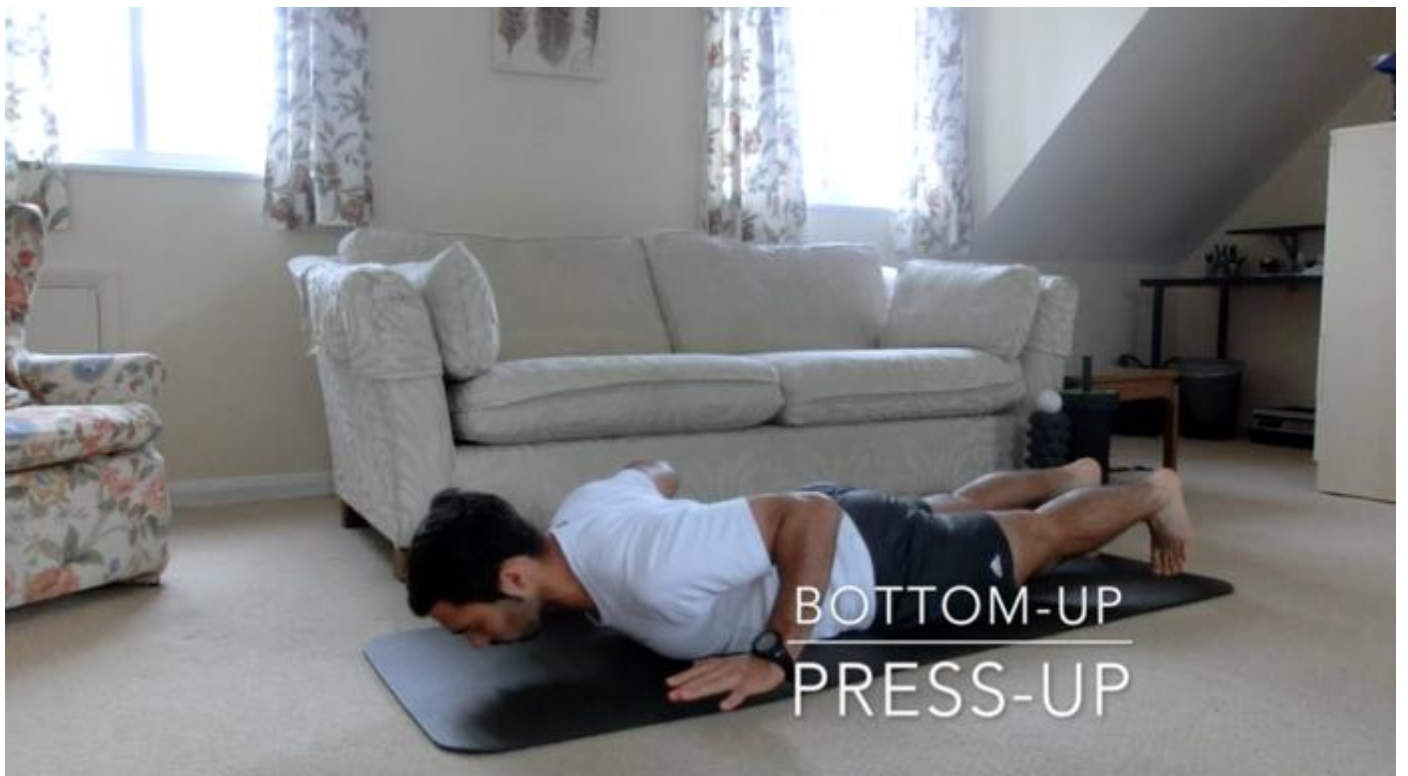
## A1 CRAB HOLD WITH OVERHEAD REACH



## A2 PRESS-UP



## A2 BOTTOM-UP PRESS-UP





### A3 DEADBUG



### A3 HOLLOW HOLD



## B1 SPIDERMAN



## B1 MINIBAND SQUAT



## B2 WAITER'S BOW



## B2 SINGLE LEG RDL



### B3 SIDE PLANK



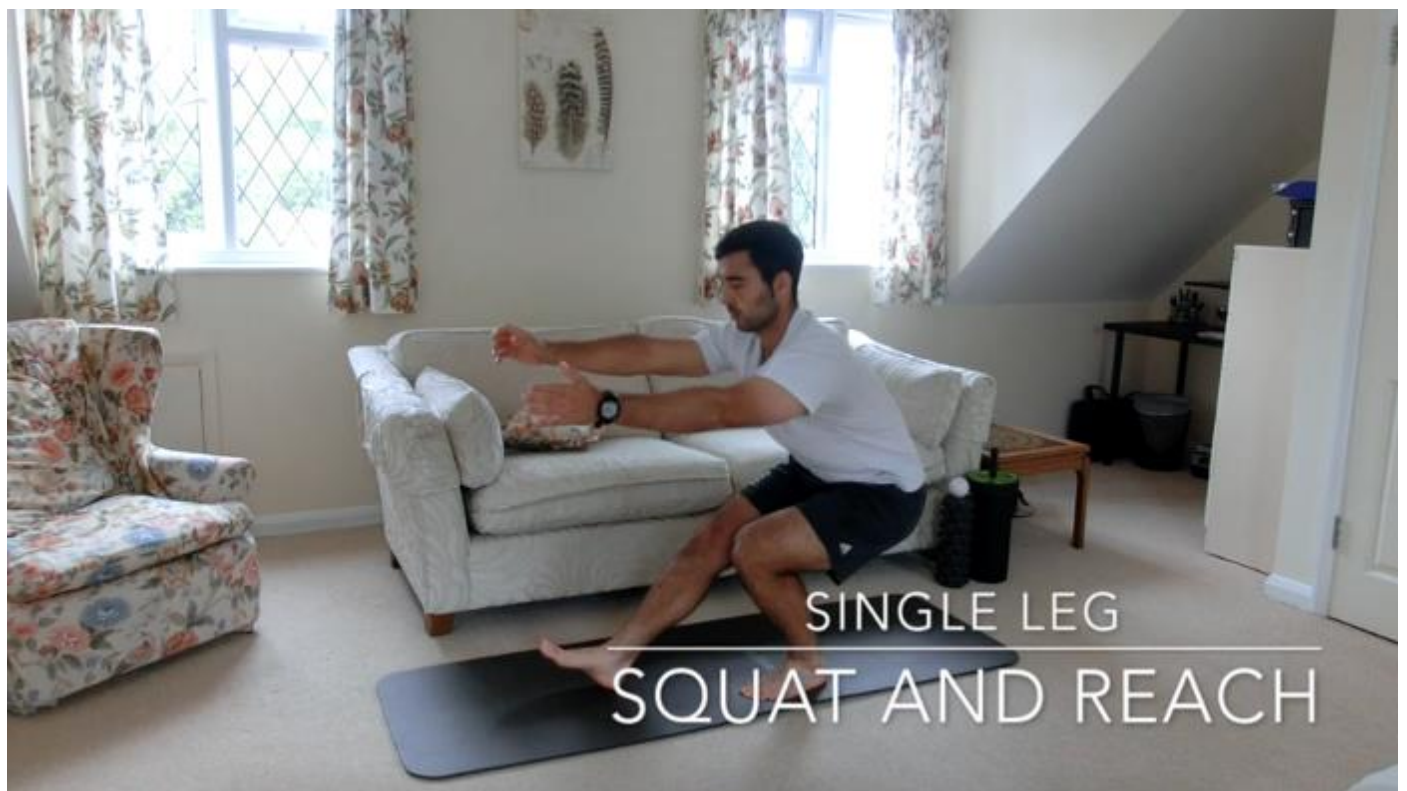
### B3 FEET-ELEVATED SIDE PLANK



## C1 SPLIT SQUAT



## C1 SINGLE LEG SQUAT AND REACH



C2 YTWI



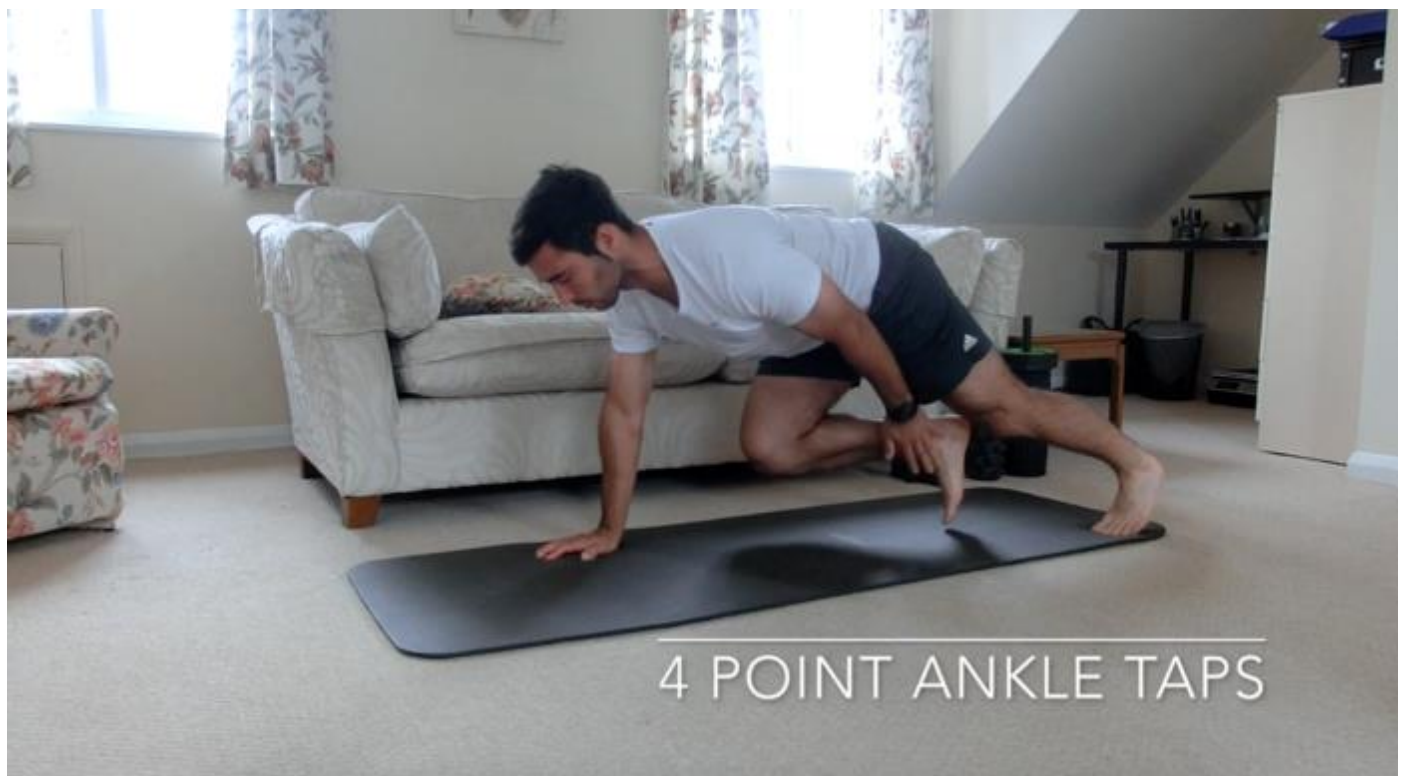
C2 BAND PULL-APARTS



### C3 LEG-LOWERS



### C3 4-POINT ANKLE TAPS



## D1 MINIBAND WALKS



## D1 BW CLAMS





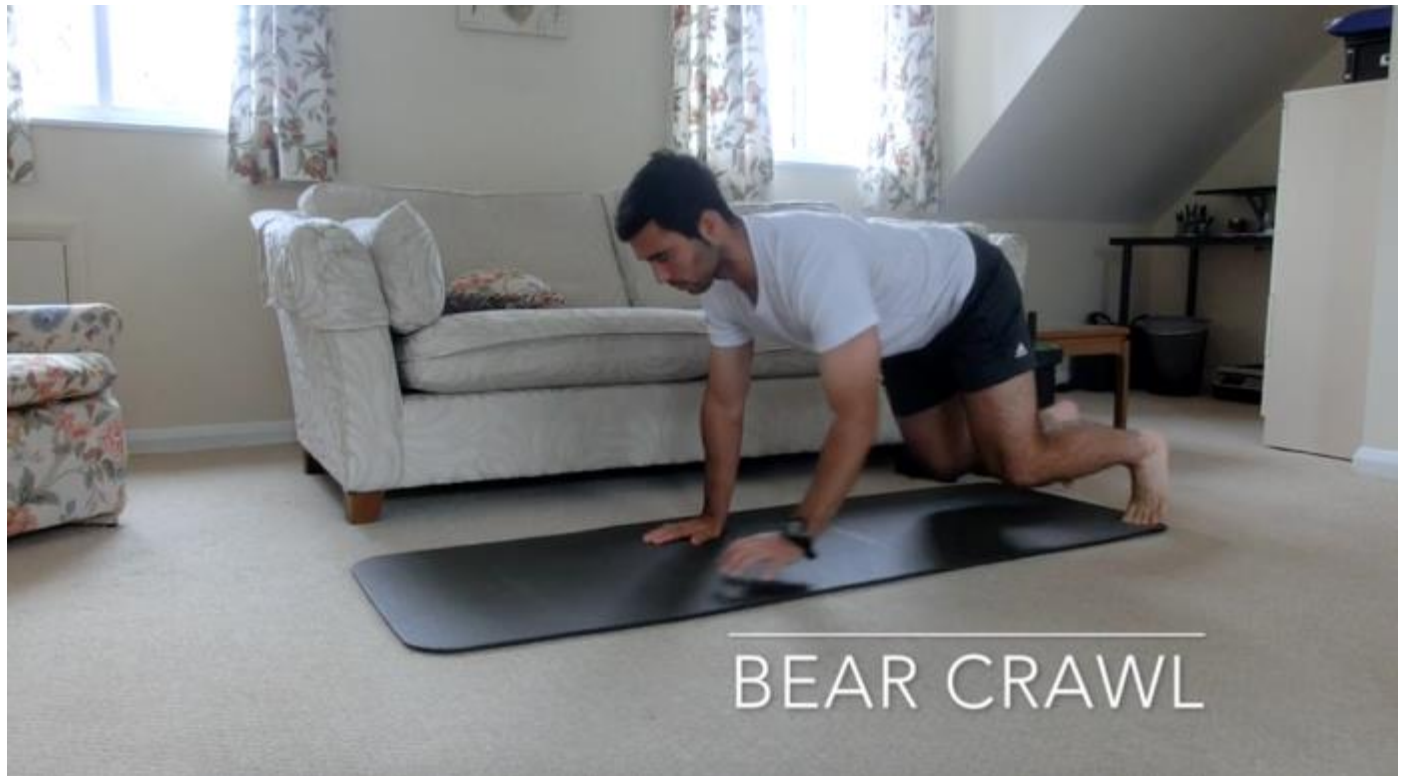
## D2 ROLL-OUTS (KNEES)



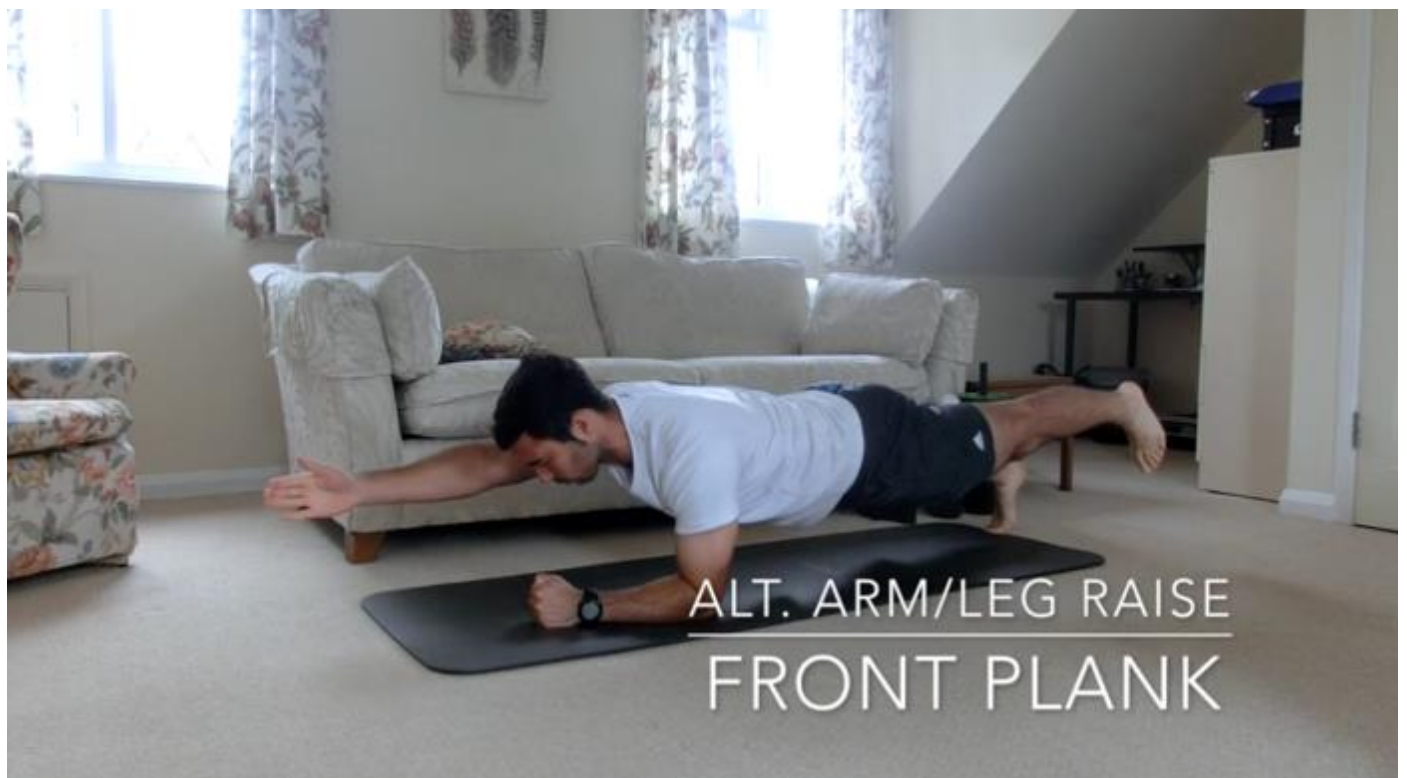
## D2 ROLL-OUTS (STANDING)



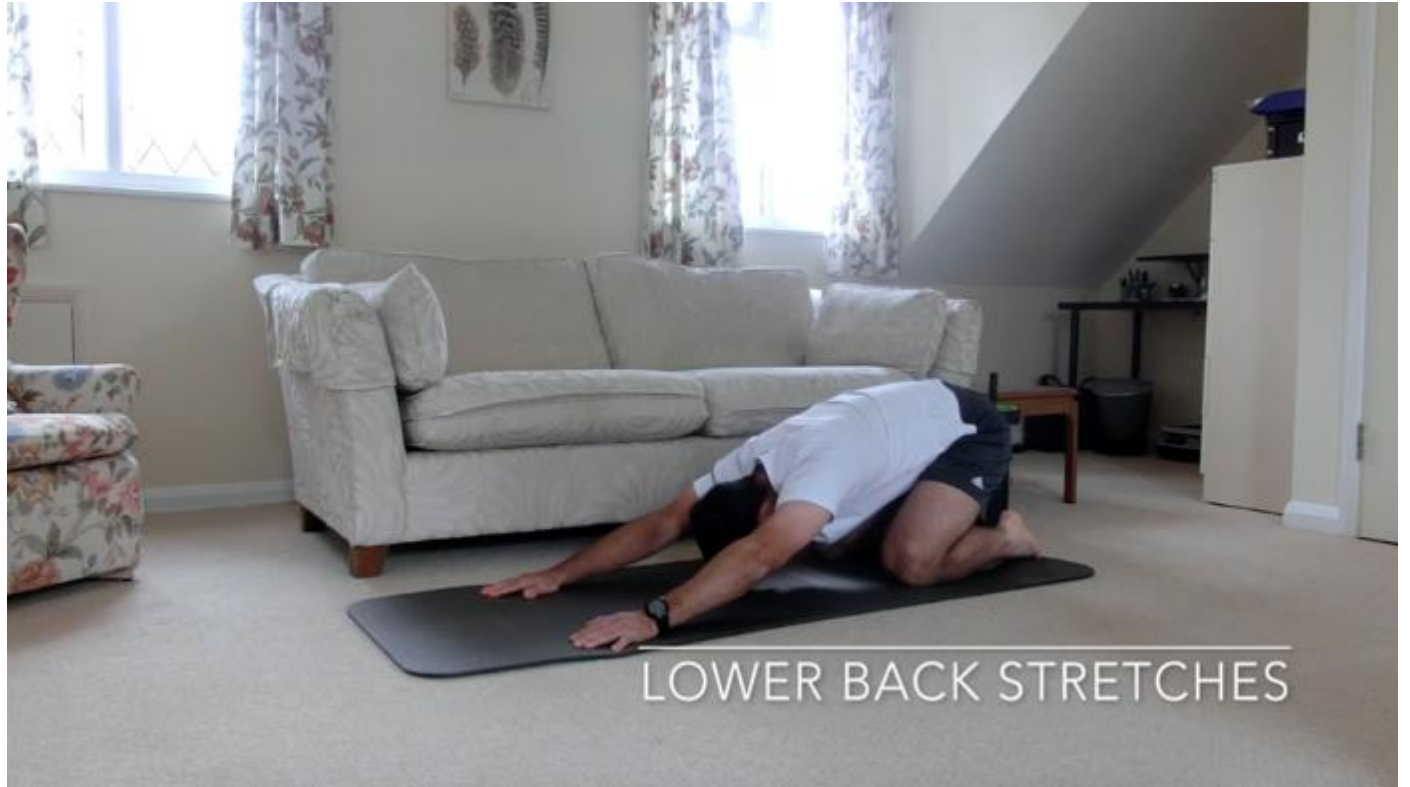
### D3 BEAR CRAWL



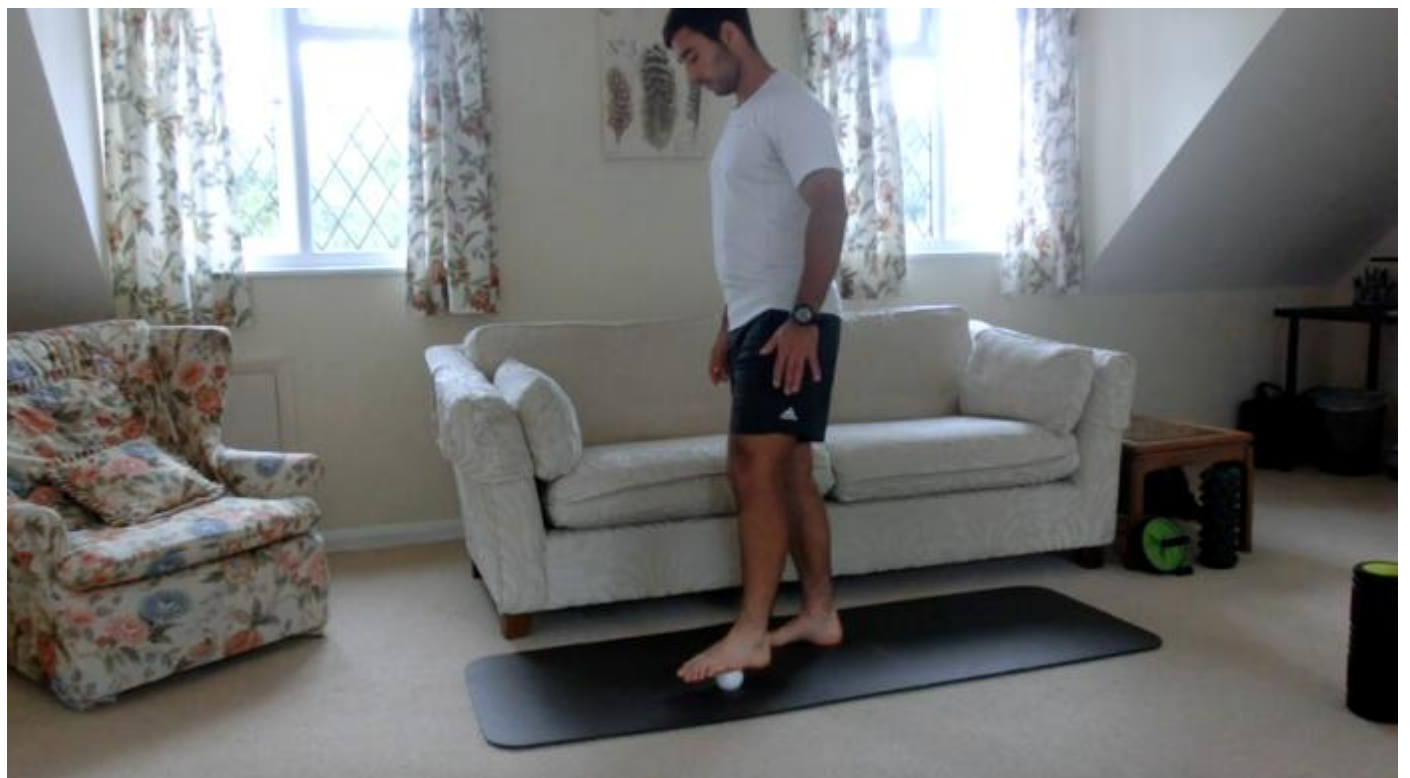
### D3 ALT. ARM/LEG RAISE FRONT PLANK



## LOWER BACK STRETCHES



## SOLE OF FOOT (PLANTAR FASCIA) RELEASE



# REFERENCES

- 
- <sup>1</sup> Katzmarzyk, P. T., Church, T. S., Craig, C. L., & Bouchard, C. (2009). Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer. *Medicine and Science in Sports and Exercise*, 41(5), 998-1005.
- <sup>2</sup> Matthews, C. E., George, S. M., Moore, S. C., Bowles, H. R., Blair, A., Park, Y., Troiano, R. P., Hollenbeck, A., & Schatzkin, A. (2012). Amount of time spent in sedentary behaviors and cause-specific mortality in US adults. *The American journal of clinical nutrition*, 95(2), 437-45.
- <sup>3</sup> Wilmot, E. G., Edwardson, C.L., Achana, F.A., Davies, M. J., Gorely, T., Gray, L. J., Khunti, K., Yates, T., & Biddle, S. J. (2012). Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. *Diabetologia*, 55(11), 2895-2905.
- <sup>4</sup> Henson, J., Yates, T., Biddle, S. J., Edwardson, C. L., Khunti, K., Wilmot, E. G., Gray, L. J., Gorely, T., Nimmo, M. A., & Davies, M. J. (2013). Associations of objectively measured sedentary behaviour and physical activity with markers of cardiometabolic health. *Diabetologia*, 56(5), 1012-1020.
- <sup>5</sup> Dunstan, D. W., Howard, B., Healy, G. N., & Owen, N. (2012). Too much sitting – A health hazard. *Diabetes Research and Clinical Practice*, 97(3), 368-376.
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