
Abertay University®
SPRINTS FOR COMBAT SPORTS
PERFORMANCE
FOR BOXING
& COMBAT SPORTS

For sprint training we utilise cycle based as it is the easiest way to control the intensity of the sessions. However, we have included other training methods for you also.

For all the protocols you should look to complete them as fast as possible. It is important to remember the aim is to go all out, as fast and hard as you can in order to promote physiological adaptations.

! *WEARING A HEART RATE MONITOR CAN BE USEFUL TO LOOK AT RECOVERY*

REMEMBER: Only undergo exercise if fit and healthy to do so.

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SPRINT PROTOCOL

EXERCISE BIKE

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When it comes to bike sprints you ideally want a bike which you can set resistance such as a Wattbike, or if you are lucky enough to have access to a sports science lab, a Lode bike for example.

The reasons for this that you ideally want to set the bike to have around 7.5 percent of your body weight for the sprints. The Wattbike for example has a comparison chart to allow you to set air flow and magnetic to match. However even if you have access to a spin bike, you can still use it, by cranking up the resistance as high as you can. What you wont be able to do is to be as precise.

WHEN PERFORMING SPRINTS ON THE BIKE WE RECOMMEND THAT YOU SPEND TIME TO ADJUST THE SEAT AND SADDLE TO THE IDEAL POSITION AND THAT YOU REMAIN SEATED THROUGH THE SRINTS. TRY TO AVOID THE TEMPTATION TO STAND UP.

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BIKE SPRINTS

GYM BIKE

POWER

SPRINT 20s

120 Seconds Recovery

X 4

WORKOUT TIME:
LESS THAN 10mins

POWER ADAPTATIONS

20 seconds x 4 repeats (Power)

1. Set resistance to 3 and bring the speed up to 100RPM
2. Increase the resistance to 17 and cycle as fast as possible through the resistance for 20 seconds.
3. Reduce resistance back to 3 and cycle at 60RPM.
4. For power you should look to do 4x20s sprints with 120s recovery between each sprint

EXERCISE BIKES CAN VARY, ITS IMPORTANT TO FIND ONE WITH VARIABLE RESISTANCE.

ENDURANCE

SPRINT 20s

40 Seconds Recovery

X 4

WORKOUT TIME:
LESS THAN 10mins

ENDURANCE ADAPTATIONS

20 seconds x 4 repeats (Power)

1. Set resistance to 3 and bring the speed up to 100RPM
2. Increase the resistance to 17 and cycle as fast as possible through the resistance for 20 seconds.
3. Reduce resistance back to 3 and cycle at 60RPM.
4. For endurance you should look to do 4x20s sprints with 40s recovery between each sprint. You should look to bring this to 20s recovery as you get used to the protocol

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BIKE SPRINTS

SPIN BIKE

POWER

15seconds x 6 repeats (Power)

SPRINT 15s

90 Seconds Recovery

X 6

WORKOUT TIME:
LESS THAN 11mins

POWER ADAPTATIONS

1. Ensure the resistance is at lowest setting and bring the speed up to 100RPM
2. Increase the resistance by 2.5 turns and cycle as fast as possible through the resistance for 15 seconds.
3. Remove resistance and cycle at 60RPM.
4. For power you should look to do 6x15s sprints with 90s recovery between each sprint

WEARING A HEART RATE MONITOR WILL ALLOW YOU TO EVALUATE YOUR RECOVERY

ENDURANCE

15seconds x 6 repeats (Power)

SPRINT 10s

20 Seconds Recovery

X 10

WORKOUT TIME:
LESS THAN 10mins

ENDURANCE ADAPTATIONS

1. Ensure the resistance is at lowest setting and bring the speed up to 100RPM
2. Increase the resistance by 2.5 turns and cycle as fast as possible through the resistance for 15 seconds.
3. Remove resistance and cycle at 60RPM.
4. For endurance carry out 10x10s sprints with 20s recovery. Look to bring the recovery down with time until 10s recovery.

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BIKE SPRINTS

WATT BIKE

POWER

SPRINT 10s

60 Seconds Recovery

X 10

WORKOUT TIME:
LESS THAN 12 mins

POWER ADAPTATIONS

10 seconds x 10 repeats (Power)

1. Set resistance on Watt bike –
 Pro (Male- air setting 5, magnet setting 1; Female- air setting 4, magnet setting 1).
Trainer (Male- air setting 10, magnet setting 5; Female- air setting 9, magnet setting 5).

2. Build an interval programme on the app. Look to carry out 10x10s sprints with 60s recovery to produce power improvements.

For both sessions you should be looking to reach 140RPM and then try and hold this speed for as long as possible. If you find you can't reach 140RPM then look to reduce the resistance.

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ENDURANCE

SPRINT 10s

20 Seconds Recovery

X 10

WORKOUT TIME:
LESS THAN 6 mins

ENDURANCE ADAPTATIONS

10 seconds x 10 repeats (Power)

1. Set resistance on Watt bike –
 Pro (Male- air setting 5, magnet setting 1; Female- air setting 4, magnet setting 1).
Trainer (Male- air setting 10, magnet setting 5; Female- air setting 9, magnet setting 5).

2. For endurance carry out 10x10s sprints with 20s recovery. Look to bring the recovery down with time until 10s recovery.

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SPRINT PROTOCOL

RUNNING

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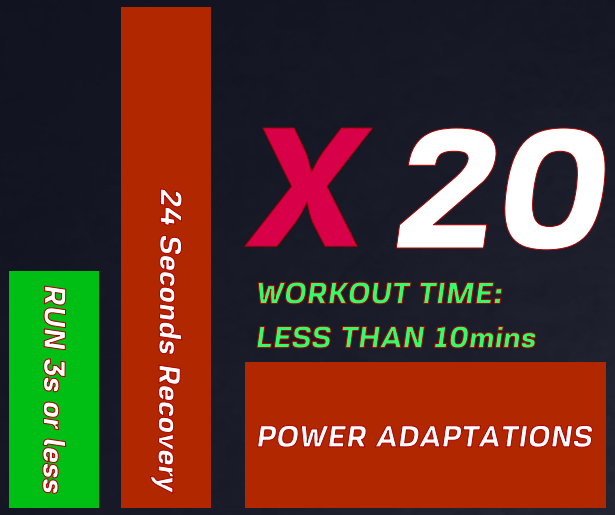
RUN SPRINTS

→15m

NO LIMITED SPACE



20 x 15m repeats (Power)

1. Each sprint should be below 3 seconds in duration.
2. For power adaptations then the recovery time between each sprint should be 24 seconds.
3. Recovery should not drop below 15 seconds if you are looking to promote power adaptations.

THE REST TO RECOVERY RATIO IS VERY IMPORTANT, ITS THE KEY TO WHAT YOU WANT TO ACHIEVE

20 x 15m repeats (Recovery)

1.Each sprint should be below 3 seconds in duration.

2.For recovery adaptations then the recovery time between each sprint should be 6 seconds.

3.To progress this then you should look to bring the recovery down to 3 seconds to match the work duration.

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RUN SPRINTS

MORE ADVANCED

POWER

RUN 6s or less

42 Seconds Recovery

X 10

WORKOUT TIME:
LESS THAN 8 mins

POWER ADAPTATIONS

10 x 15m shuttle (Power)

1. Each sprint is now covering a 30m distance with a 180 degrees turn at 15m.

2. The time to complete this should be below 6 seconds.

3. The recovery between each sprint should be 42 seconds to promote improved power.

4. As you progress you can change this to a sprint that is every 30s regardless of how long each sprint takes.

MAKE IT HARDER BY TOUCHING THE LINE WITH YOUR HAND AS YOU TURN AT THE 15 METRE LINE!

RECOVERY

RUN 3s or less

6 Seconds Recovery

X 10

WORKOUT TIME:
LESS THAN 3 mins

RECOVERY ADAPTATIONS

10 x 15m shuttle (Recovery)

1. Each sprint is now covering a 30m distance with a 180 degrees turn at 15m. The time to complete this should be below 6 seconds. T

2. The recovery between each sprint should be 6 seconds to promote recovery.

2. As you progress you can change this to a sprint that is every 12s regardless of how long each sprint takes.

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UNLIMITED

RUN SPRINTS

NO LIMITED SPACE

POWER

RUN 25s or less

180 Seconds Recovery

X 6

WORKOUT TIME: LESS THAN 20mins

POWER ADAPTATIONS

6x200m (25s) repeats (Power)

1. Each 200m repeat should take about 25s.
2. Therefore, to promote power adaptations then you would be looking for 180 seconds recovery between each sprint.
3. This should be an active recovery looking to keep the body moving. If using distance then you should look to cover a minimum of 300m in the 180 seconds.

These can be done either using time or distance to determine duration. When outdoors it is normally easier to use time unless you have something like a Garmin or other GPS watch where you can set up training protocols based on distance.

RECOVERY

RUN 25s or less

20 Seconds Recovery

X 6

WORKOUT TIME: LESS THAN 3 mins

RECOVERY ADAPTATIONS

6x200m (25s) repeats (Recovery)

1. Each 200m repeat should take about 25s.
2. Therefore, to promote recovery adaptations then you would be looking for 20 seconds recovery between each sprint.
3. If using distance, then it should be 75m recovery.

We do not suggest any more than a 400m repeat. The longer the distance you use then the less sprints you should have.
If you go down to 100m repeats then you should be looking at 10 repeats.
You can add in change of direction as well to make the task harder; I would always use a 180º turn.

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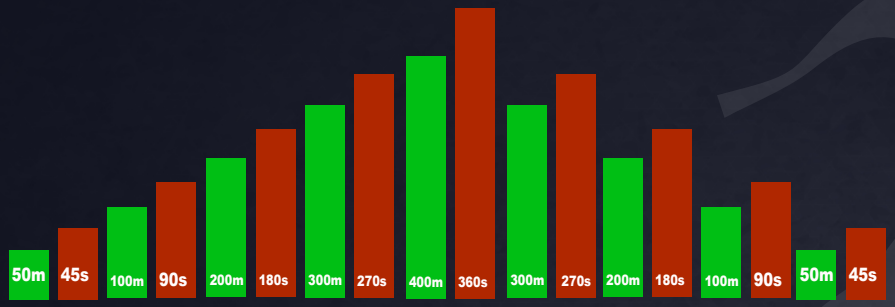
UNLIMITED

RUN SPRINTS

ADVANCED

POWER

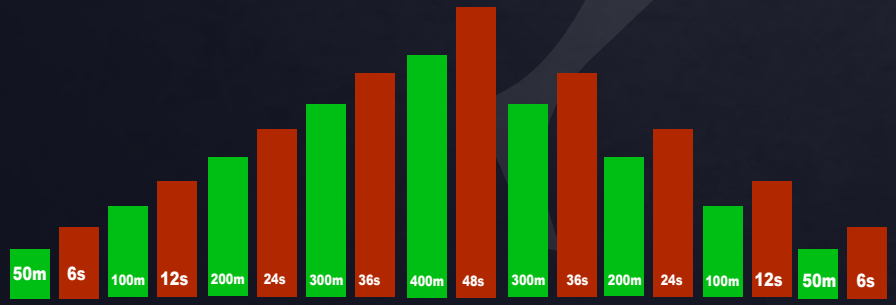


Undulating repeats (upwards for power)

50m (recovery 45s)
100m (recovery 90s)
200m (recovery 180s)
300m (recovery 270s)
400m (recovery 360s)
300m (recovery 270s)
200m (recovery 180s)
100m (recovery 90s)
50m (recovery 45s).

If you want to increase the intensity of these sessions, then you can carry them out on a hill or on a sandy beach. On a hill the greater the slope the more intense each interval will be.
We have found that a 10% slope recreates a similar load to what we have in the bike.
If there are dunes on the beach then use these to increase the intensity.

RECOVERY



Undulating repeats (upwards for recovery

50m (recovery 6s)
100m (recovery 12s)
200m (recovery 24s)
300m (recovery 36s)
400m (recovery 48s)
300m (recovery 36s)
200m (recovery 24s)
100m (recovery 12s)
50m (recovery 6s).

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SPRINT PROTOCOL

BAG WORK

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BAG WORK

HEAVY BAG

PUNCH 20s

60 Seconds Recovery

X6

WORKOUT TIME:
LESS THAN 9 mins

POWER ADAPTATIONS

POWER

6 X 20 seconds with 60 second recovery.

1. Use a heavy bag striking with only power shots (hooks, body / head height)
2. Aim to go all about from a fixed position, paying attention to technique.

Whilst this is about as many strikes as you can in the time, good technique is crucial.

3.Remain standing during the 60 second recovery period.

It is important that hand wraps and appropriate gloves are worn. The bag sessions presented here are maximal effort, meaning you must go all out whilst keeping technique. We want full extension of the punches, and to avoid close in small range (rabbit) punches as the aim is to increase heart rate and workload. When in the recovery period it is important to stand stationary and be ready to repeat.

PUNCH 20s

20 Seconds Recovery

X6

WORKOUT TIME:
LESS THAN 5 mins

RECOVERY ADAPTATIONS

RECOVERY

6 X 20 seconds with 20 second recovery.

1. Use a heavy bag striking with only straight shots (jab, cross)
2. Aim to go all about from a fixed position, paying attention to technique.

Whilst this is about as many strikes as you can in the time, good technique is crucial. However it is important that this is above a maximal effort, i.e. all out.

3.Remain standing during the 60 second recovery period.

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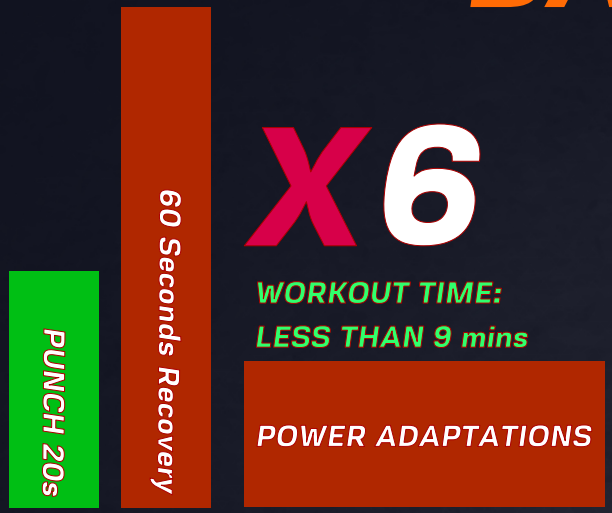
BAG WORK

HEAVY BAG



POWER

6 X 20 seconds with 60 second recovery.

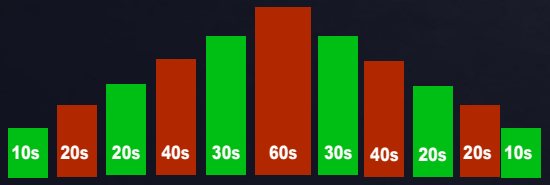
1. Use the heavy bag you will throw a rear hand cross, followed by lead hand hook. The key is is to start from the stationary position and strike as fast as possible with maximum power and mechanics.

2. Aim to go all paying attention to technique and using the transfer of weight from the rear hand landing to generate power from the lead leg delivering the hook.

3.Remain standing during the 60 second recovery period.

REMEMBER TO USE GOOD TECHNIQUE AND MECHANICS WHEN DELIVERING STRIKES.

RECOVERY



X2

WORKOUT TIME:
LESS THAN 11 mins

Undulating

10s (recovery 20s)
20s (recovery 40s)
30s (recovery 60s)
30m (recovery 60s)
20s (recovery 40s)
10s (recovery 20s)

1. Striking should be all out, with good technique.
2. Recovery should be standing near the bag.
3. Each round you should attempt to work harder than the last.
4. Always touching the bag, even if you move around it.

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SPRINTS FOR COMBAT SPORTS

JOHN BABRAJ PhD.:
John is a senior lecturer in exercise physiology at Abertay University, Dundee. He has a PhD looking at protein metabolism in response to exercise and nutrition. A major focus of his research has been on sprint interval training, and he is viewed as one of the leading experts in this training modality. Currently a major research focus is the physiological responses to sprint interval training that improve recovery of athletes during competition, for example within and between rounds in combat sports.

ANDREW USHER MRes SENr.:
Andrew is a performance specialist working with a range of athletes, ranging from amateur , professional boxers and MMA athletes. He hold a Masters of Research degree in Sport and Exercise Science, where he looked into the underlying physiology of amateur boxing. He is currently undertaking his PhD at Abertay University where he is undertaking ground breaking research into the physiological demands of professional boxing.

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For information on personalised training, or to enquire about strength and conditioning, performance nutrition or performance testing, then please email Andrew Usher at andrew@andrewusher.com

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