







EXPLOSIVE TRAINING

What is Explosive Training?

Intense training and efforts that require the repeated use of Explosive Power.



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Explosive Power!


- Let's define the "power" we are taking about: **Force x Speed** (not watts)
- Maximal Force!
- Maximal Leg Speed!

= Maximal Explosive Power!

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Neuromuscular Power




Explosive efforts not only require muscular strength but emphasize the nervous system responsible for **forcefully contracting** (firing) the muscle. This combination is referred to as neuromuscular power.

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Benefits of Explosive Training

- My classes love it (no, really)
- Increased muscle fiber recruitment
- Promote rapid communication between the nervous system and muscle (rate of fire/contraction)
- Develop/Strengthen fast-twitch (Type II) muscle fibers
- Training for cycling events that require explosive efforts





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Maximal Recovery

Rest and Recovery is the Key. Unless the body is fully rested before the start of this workout, a rider will be limited in producing a maximum effort.

This includes:

- Muscular System
- Cardiovascular System
- Fuel & Hydration



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Intermediate Recovery

Besides entering the workout fully rested, it is important to provide the appropriate amount of recovery between each explosive effort during drills.

So....what is appropriate?



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Welcome to the "Real" World

When performing a **maximum** effort on a bike outdoors, such as a 20-second sprint, a cyclist can require 4 - 6 minutes to recover before attempting another **maximal** effort.



And.....


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The Indoor World

Although it may be tough to get riders to recover for 4 minutes between each sprint during an indoor cycling class, a **2-minute** recovery is a good alternative.

You can always instruct riders to skip a sprint if they require additional recovery.



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Not All Explosive Efforts provide Maximal Recovery


There are times when explosive efforts occur with no rhyme or reason.

- Jumps
- Attacks (Multiple)
- Tabata Training

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Guidelines



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Perceived Effort? Target Zone?

- 110% or GO HOME!
- 110% or DON'T BOTHER!

Heart rate can not respond fast enough to capture the intensity

Neuromuscular Power (watts) can be 2+ times your sustained power at 100% RPE




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Target Cadence

Leg speed can vary. Some of the top pro sprinters turn their legs between 95 and 125 RPM during explosive efforts

Goal: **Heaviest Resistance at the Fastest Leg Speed**

- Slow (< 70 RPM) can place excessive stress on muscles
- Fast (> 120 RPM) can place excessive stress on joints



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SAFETY WARNING!

(Due to biomechanical limitations)
Leg speeds less than 50 RPM (with heavy resistance) and leg speeds above 120 RPM are not recommended on indoor bikes.





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How Long is an Explosive Effort?

It depends on...

- the rider's **muscular strength**
- The rider's **muscular fatigue**


And...



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FUEL: Hello Anaerobic Pathways!

- Explosive efforts are often too short and intense for effective use of energy generated aerobically
- Muscle Glycogen
- Creatine Phosphate (ATP-CP)
- **Maximal: ATP-CP (8-12 seconds) augmented by muscle glycogen = ~30 seconds**



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When are Explosive Efforts Appropriate?

- Riders should have a good fitness base. This includes 8 to 12 weeks of training to condition connective tissues and develop muscular endurance and strength.
- For the cyclists: March/April and on
- Depends on your class demographics (beginners, special populations, etc.)



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Explosive Efforts & Indoor Cycling



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Explosive Efforts and Indoor Cycling

- Safety First
- Bike Limitation(s):
 - Most Bikes do not move Side to Side
 - Bikes do not move forward and backward
- Controlling the weighted flywheel
- Maximal Resistance!




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Indoor Formula for Sprints

To keep explosive efforts safe indoors, use the following formula:

- (1) Load (add resistance)
- (2) Stand (protect the back)
- (3) Explode (BOOM!)
- (4) Unload (reduce resistance)




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Sample Explosive Efforts

Form Sprints

Length: 15-30 Seconds
Intermediate Recovery: 60+ Seconds

- These are often performed at 85% of a rider's maximum ability
- Great way for riders to experiment with the amount of resistance they will use
- Allows riders to practice proper "form" and the formula for safe explosive efforts.




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Sample Explosive Efforts

Jumps

Length: 10 – 15 Seconds
Intermediate Recovery: 2 Minutes

- Heavy resistance
- Start with a slow cadence and then explode (sprint) until the resistance is overcome
- Excellent training for muscle fiber recruitment.



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Sample Explosive Efforts

Criterium Sprints

Length: 30 Seconds
Intermediate Recovery: 2+ Minutes

- The "Explode" Formula:
 - First 10 seconds – Accelerate
 - Second 10 seconds – Sustain 95%
 - Final 10 seconds – Flip the switch*

*Think "Fast and the Furious"
Nitrous Oxide (NOS) = BOOM! GO!




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Sample Explosive Efforts

Attacks

Length: 15-30 Seconds
Intermediate Recovery: 30+ Seconds


- Simulates actual race conditions where jumps and attacks are not predictable
- Don't exacerbate your riders in an attempt to provide a hard workout
- Don't use this as an excuse to violate the science and physiological principals



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Remember!!!

- Remember how you felt after our earlier explosive workout? Use this to gauge your classes limitations.
- Only those with a high level of fitness and training can sustain back-to-back explosive efforts/attacks
- Sprints should NOT be used to spice up your class. They are serious, high-intensity, advanced efforts.
- Explosive efforts and movements can place your riders at risk. Make sure they are appropriate for your class' ability.



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Q & A
Questions, Concerns &
Cries of Despair



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Thank You!

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