THE FLAT PEDAL REVOLUTION MANIFESTO

The science and logic behind using flat pedals to become a better rider.

Manifesto (noun): a written statement declaring publicly the intentions, motives, or views of its issuer.
The Flat Pedal Revolution Manifesto is the result of a long and unintended journey. As a strength coach with a passion for mountain biking I never wanted to become a leader of the Flat Pedal Revolution, much less put together this manifesto for the cause. However, it is a cause that I have embraced and feel is worth fighting for.

At the heart of this revolution is a fight to debunk the common myths about the value and drawbacks of both flat and clipless pedals, especially for new riders. Everyday mountain bike riders are told by people at bike shops and trail heads that you can't pedal nearly as efficiently or effectively without clipless pedals. Plus, every magazine and website you read has countless ads and articles touting clipless pedals and shoes, reinforcing the message that they are essential to mountain biking badassery.

I know this because I've experienced it firsthand. When I started riding mountain bikes I was told that I needed to get into clipless pedals ASAP - only beginners and downhillers used flat pedals. I saw the charts showing how I needed to be attached to my pedals to allow for the most efficient pedal stroke. Although I was having fun and making progress on every ride I also felt that I was somehow holding myself back by riding flat pedals.

Eventually I decided to take the plunge and try clipless pedals. Over the course of a month I spent hours practicing getting in and out of them but I could never get my left foot to cooperate to the point I felt comfortable on the trail. After falling over at a stop sign because I couldn't get unclipped I figured I would have died if that had happened on the trail and decided to go back to my flats - they were way more fun and less stressful.

I figured I would take flats as far as I could and switch to clipless pedals when I felt that my pedals - and not my fitness and skills - were holding me back. After more than 15 years of riding I'm still waiting for that day…

These myths also keep a lot of riders trapped using clipless pedals despite the fact that they don't like the mental stress of using them. I get emails every week from riders thanking me for “giving them permission to try flats” (their words, not mine). They tell me how they have rediscovered their passion for the trail because of flats, otherwise they might have simply quit riding. Plus, they all report no decrease in speed on the trail, simply more fun and less stress.

Over the years I've not only seen how well you can perform with flat pedals - both with myself and with other amazing flat pedal riders I have met - but I've also come across a lot of information that explains why that is. This info debunks the common myths surrounding the pedal stroke and how clipless pedals supposedly enhance it, shedding new light on a subject that is still misunderstood by the vast majority of riders.
My hope is that this Flat Pedal Revolution Manifesto will serve as the jumping off point for a lot of thought and conversation about this subject. I created it as a resource for both myself and other riders to point other riders to quickly get them up to speed with core principles of the cause - flats can make you a better rider in some ways, just like clipless can make you better in others. Knowing the facts about each is the key to being the best rider possible.

As the only resource in the world that both debunks the common myths surrounding the pedal stroke and gives essential advice to help riders improve their performance on flat pedals I hope that those of you who are already part of the revolution will point your friends and riding buddies to it when they ask why you use flat pedals.

If you are reading this because you are curious about flat pedals and haven't tried them yet I hope that this info will give you the confidence and tools you need to take that plunge. Once you see that there is no magical pedal stroke only allowed by being attached to your pedals you'll be shocked to find out just how fast you can be on flats.

So, in conclusion, remember that this is not about flat pedals being better than clipless pedals, it is about understanding the real value and application of both systems.

Being pro-flats isn't the same as being anti-clipless and misapplying either pedal system in the name of blind ideology isn't helping advance our sport as a whole.

Ride Strong,

James Wilson

MTB Strength Training Systems & Pedaling Innovations

P.S. I need to ask your help to get this information to the riders who need to hear it. Please post it on Facebook, Tweet it, post a link to it in the mountain biking forum you frequent - anything that will help spread the word about the Flat Pedal Revolution. Like any true revolution, the only way it can be won is to work together on a grassroots level. My voice is nothing compared to our collective voices and this is information a lot of riders around the world need and are looking for.
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Introduction

This article is one I have been wanting to write for a while simply to clarify my overall position on this whole "flats vs. clipless pedals" debate. The internet is a double edged sword for me on this subject because, on one hand, it allows me a platform to easily get my ideas on this subject out there to riders who need the info but, on the other hand, it is easy to read one thing I write and take it out of context. I have created a couple of dozen articles and videos over the last few years explaining the multiple layers of my position but I understand that not everyone has read/ seen more than a couple of them, making it easy to misunderstand my ultimate position. To add even more confusion, this blog has seen me flesh out my ideas and positions in front of a live audience and those things have evolved over the years.

I realized after my article on Which Muscles are Really Used During the Pedal Stroke that a lot of riders still think that I dislike clipless pedals and every time I point out a myth about them or promote the use of flats I am, in essence, saying that clipless pedals suck and are worse than flats. I think that some riders even envision me harassing everyone I see about the subject and will only ride with som one if they are on flats. However, this is far from the truth.

I wrote this in a response to a comment and I'll repeat it here because it sums up my overall position perfectly-

I am not anti-clipless pedals, I am pro flat pedals. I think that both have their place in riding, specifically I believe that flats make you better and that clipless can make you faster.

This is a very important distinction because it means that I am not saying that one is better than the other, simply that both have pluses and minuses and, unlike the vast majority of the cycling world, I champion the advantages of flats. I do believe that there are a lot of myths and half-truths surrounding the subject – mainly on the perceived disadvantages of flats – and that riders deserve to know both sides of the story before making a decision about which is better for them.
I think that the are pluses and minuses to both pedal system but for too long the deck has been stacked firmly against flats, with a downplaying of any disadvantage to clipless pedals and no mention of any advantage for flats. There were even some pluses being stacked on the clipless pedal side that simply weren’t true, like the need for them to use the hamstrings during the upstroke.

All I am trying to do is help bring the whole story to the table, which means that I have to point out the advantages of flats, the disadvantages of clipless pedals and clear up the myths surrounding the whole subject. Taken out of context of the bigger picture that I am trying to even out an argument that is decidedly one sided it is easy to take those things and interpret my position as being “anti-clipless”. I almost have to come across as “anti-clipless” just to start dragging this debate back to center but I am really not a “flat pedal only” zealot.

This really hit home for me a few weeks back when I found myself actually defending the use of clipless pedals for racing. Clipless pedals do have advantages in high performance situations like racing and when someone started going down the road of flats being the best choice for everybody, all of the time I found myself defending their use, given that whoever was using them could ride flats in the first place.

Which brings me to my last point – what I am against is the use of clipless pedals before someone can ride at a proficient level with flats. I think that there is a process for learning how to pedal and maneuver your bike on the trail and that it begins with flats and, even if you do use clipless pedals, you should retain your ability to ride at a reasonable level with flats. Flats keep you honest and force you to learn good technique and clipless pedals should make you faster by enhancing that good technique, but this is not the case with most riders on clipless pedals.

Most riders have never spent any real time on flats, much less a good set of flats and flat specific shoes like 5-10s, and instead went into clipless pedals right away. My message to them is not that they should throw their clipless shoes and pedals away but that they will get more out of them and be better overall riders if they took a break from them and re-learned how to ride with flats. After learning how to ride without them you’ll find clipless pedals to make you even faster when you go back to them.

Before I close, I do think that it is important to point out the elephant in the room – clipless pedals do contribute to crashes and scare new riders away. I have spoken to too many riders who start their injury story off with “I couldn’t get unclipped” and other cyclists who talked about how they tried mountain biking but being clipped in scared them to pretend that this isn't happening.
I think that new riders should spend at least 6-12 months learning on flats before considering the switch to clipless pedals. The snobbery of riders who are able to ride clipless pedals at a high level and then dismiss people's very real fears and concerns with an "I've never had any problems so neither should you" attitude as they continue to tell every new rider they meet that they need to get clipless pedals ASAP is ridiculous.

So ride clipless pedals, I honestly don't care. If you took the time to learn on flats and are using them for high performance/racing situations then they can offer an advantage. Just don't tell me that there are not very real disadvantages to clipless pedals for the new and average rider (especially for mountain biking) and that you can not be a very good rider on flats, doing everything with them that you can with clipless. Being pro-flats isn't the same as being anti-clipless and misapplying either pedal system in the name of blind ideology isn't helping advance our sport as a whole.
The Science Behind Foot Position

J.R. Van Sickle Jr, M.L Hull/ Journal of Biomechanics 2007 – This study showed no difference in power or economy between pushing through the ball of the foot and the mid-foot pedal position. They thought that there would be a decrease in those factors since you couldn’t use the ankles for leverage and push with them. However, this wasn’t the case and they found that pushing through the ball of the foot wasn’t “better” or the optimal way to apply power into the pedals. In fact, they also found that the mid-foot position took stress off of the calf and Achilles tendon, placing it on the hips.

ELMER, S. J., P. R. BARRATT, T. KORFF, and J. C. MARTIN. Medicine & Science in Sports & Exercise 2011 – This study found that the hips (glutes and hamstrings acting to extend the hip joint) were the major drivers of the pedal stroke at all intensity levels. This means that the quads are never the major driver of the pedal stroke.

Collectively, these studies have shown that:

1. The mid-foot position also allows for better recruitment of the hips.
2. The hips are the major muscles used in the pedal stroke.

So, if your hips are the major drivers of the pedal stroke and the mid-foot position allows you to better recruit the hips then it would seem that the science favors the mid-foot position for better hip recruitment.
Slides from the Mornieux and Korff Cycling Efficiency Studies

Below you will find the slides from the Korff (et al. Med Sci Sports Exerc 2007; 39:991-995) and Mornieux (et al. Int J Sports Med 2008; 29:817-822) Cycling Efficiency Studies that I will reference many times in this manual. It is important that you know that there is real science behind what I am going to talk about and that it is not just based on my opinion.

I'd also like to point out that as far as I know there are no studies supporting the need to pull up on the backstroke. Along with the other evidence I will bring up later, this means that the true science-based view of the pedal stroke is the one I present in this manual.

Effect of pattern of force application on efficiency

- Note how the preferred and pushing pedaling technique are the most efficient.
These last 2 slides suggest to me that we naturally want to pedal in the strongest, most efficient way which is to push hard into the down stroke and not focus on what the trail leg is doing. When we start trying to outsmart instinct (you want to spin in circles and/ or pull through the top) we literally decrease pedaling power and efficiency.
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THE SCIENCE & MOVEMENT PRINCIPLES

MAXIMIZING YOUR PERFORMANCE WITH FLAT PEDALS

DEBUNKING COMMON CLIPLESS PEDAL MYTHS

MORE FUEL FOR THOUGHT...

This study shows that there is no special pedal stroke allowed by clipless pedals. In fact, since force application at the pedals was the same for both you should be able to pedal in a similar manner with either pedal system, suggesting that if you can’t ride flats you may have some issues with how you apply force to the pedals.
Which Muscles Are Really Used During the Pedal Stroke?

One of the most persistent myths in the mountain biking world surrounds the pedal stroke and goes something like this – without being attached to the pedals you cannot use your hamstrings properly which forces you to rely too much on the quads to power the pedal stroke. By not being able to curl the knee joint during the upstroke of the pedal stroke you create muscular imbalances and tire out the quads faster, or at least that is what most of us have been told. However, this understanding of which muscles are used and how they are used during a pedal stroke is completely wrong and potentially dangerous over the long run.

When I ask why someone thinks that the muscles are used this way during the pedal stroke I am invariably led to some variation of this picture/chart:
According to this theoretical model of muscles used during the pedal stroke the hamstrings are used maximally from 8 o'clock to 10 o'clock position while the glutes and quads are responsible for the downstroke part of the pedal stroke. This paints a completely false picture of the situation and leads a lot riders to assume that the hamstrings are only there to flex the knee joint on the upstroke, which would be impossible to do if you weren't attached to the pedals. This, of course, would mean that it would be impossible to optimally pedal without clipless pedals, which is where the faulty logic that tells rides that it is impossible to pedal optimally without them stems from.

The problem with this whole notion is that this chart is completely theoretical and based on how the muscles work in isolation from each other. Unfortunately, the reality of how the muscles work together to create the actual pedal stroke movement is much different than the what this chart tells us. The model this chart is based on also assumes that all muscles that cross a joint are there primarily to flex that joint, as if the muscles on the front side mirror the actions of the muscles on the backside.

The human body is not set up so that the muscles are mirror images of each other – the hamstrings are not the “backside” quads. The hamstrings are made to powerfully extend the hips while less powerfully flexing the knee, the quads are made to powerfully extend the knee while less powerfully flexing the hip. Together they both work with and counteract each other to produce lower body locomotion. Train the hamstrings to flex the hips and stabilize the knee and the quads to flex the knee and help stabilize the hip joint – that is how those muscles function in real life and how we should train them, not based on the old model of training each muscle that crosses a joint to powerfully flex it.

In fact, trying to have a rider curl their hamstring to produce force on the upstroke is unnatural and asks the knee to produce force in an unstable position. Your hamstrings are not made to produce power by curling at the knee and instead are made to produce power at the hips while helping to stabilize the knee joint. The idea that you need to curl your leg through the bottom and upstroke portion of a pedal stroke is simply wrong and based on old and faulty logic – you want to flex the hip to push the leg through the bottom of the pedal stroke, not flex the knee.

Just like when running you don't want to produce power by flexing the knee, you simply use knee flexion to get the leg back into position for the next “push”. The human body is made to push, not to pull, and trying to apply pulling (curling the knee is a pull) to lower body locomotion isn't the most effective thing to do.
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You want to produce your power at the hips, not the knee joint. The reason that a lot of riders have the knee issues is because the knee joint lacks stability, not strength. On a side note this is why I am an advocate for standing up more to pedal because it forces the knee and hips joints to act and stabilize more naturally than seated pedaling does.

As an interesting side note, I came across this chart of a pedal stroke while researching this article. It looks like it was based on actual EMG readings, not a theoretical model.

As you can see the Biceps Femoris (fancy talk to hamstring) is most active on the downstroke and least active on the upstroke. In fact, where first chart shows the hamstring to be most active is actually the place it is least active according to the EMG in the second picture. In other words, the first chart is flat out wrong and in no represents what is actually happening during a pedal stroke.
Take another look at the second picture and you'll see how the downstroke finds all of the muscle groups lighting up and the upstroke sees very little activity by comparison. This also underscores the findings in the Mornieux (et al. Int J Sports Med 2008; 29:817-822) and Korf (et al. Med Sci Sports Exerc 2007; 39:991-995) Cycling Efficiency Studies I have referenced in the Flat Pedal Revolution Manifesto.

In them you see that a powerful downstroke with the lead leg and a more passive return of the trail leg was the most powerful and efficient way to pedal. You shouldn't be worrying about trying to create power on the upstroke, which means that you can create the most powerful and efficient pedal stroke without being attached to your pedals.

So what does this mean for you?

You can (and should) be able to pedal your bike very effectively with flat pedals. This myth is one of the most common ones I hear from riders as to why they don't want to try flat pedals when in fact flat pedals will actually clean up and improve your pedal stroke. I have written extensively about this on my site and before you assume that I hate clipless pedals I suggest you read the article Just Because I am Pro-Flats Doesn't Mean I am Anti-Clipless.

You should train your legs to produce a powerful downstroke using the hips as the primary power source, not the knee joint. This means that leg curls and leg extensions are bad exercise choices since they reinforce this “knee powered” pedal stroke. Exercises like single leg deadlifts and single leg squats are much more effective since they train the legs to drive from the hips, not the knees.

When riding don't worry about “spinning circles” or “keeping equal pressure on the pedals”. Do not try to curl the hamstring through the return portion of the pedal stroke. While a good, efficient pedal stroke may feel like you are spinning circles the reality of what your muscles are doing to produce that feeling are much different. Your body has one way to optimally produce lower body locomotion and you simply want to apply it to the pedal stroke.
The idea that you can not optimally use your hamstrings during a pedal stroke without clipless pedals is based on faulty logic and theoretical models. Now that we have a more accurate insight into what is actually happening we see that models like the first picture/chart need to stop being used as a way to think about pedaling our bikes. The hamstrings are one of the more important muscles used during the pedal stroke but it is how they work in concert with the other muscles of the lower body on the downstroke – not by themselves on the upstroke – that form the reality of pedaling your bike.
Why You Don’t Want to Push Through the Ball of Your Foot When You Pedal

Your feet are an important contact point with the bike. Without your feet being in the right place you will pedal with less power, be less stable through technical trail sections and set yourself up for an overuse injury.

The problem is that most riders have been given the wrong idea about where to place their foot on their pedals. You see, we forget that at one point someone took a guess about where to place the foot on the pedal and today we simply take it as gospel.

But what if the original “pedal stroke theorists” were wrong? What if they didn’t realize that they were looking at things the wrong way and applying the wrong logic sequence to the problem?

In other words, what if the current advice about where to place your foot on the pedal is based on faulty logic in the first place?

But before we can even start getting into the logic sequence of where you want to place your foot on the pedal we need to back up and answer an even more important question...

Does pedaling a bike require an engineering based or a movement based solution?

For a lot of people this is the first time they have ever heard this question. They've always assumed that there was just one logic sequence you could use to arrive at the perfect pedal stroke so let me explain the difference.

And once I do you will see how important this question really is.

The engineering based solution looks at pedaling the bike from the bikes point of view – if we were going to design a machine to power this bike, what would we want it to do?
However, the movement based solution looks at things from the human organism’s point of view – how do we take the way the body is hardwired to optimally move and apply it to the bike?

For a long time the engineering based solution has been the dominate train of thought in pedal stroke theory. When you do that you can come up with all sorts of nifty ideas on how to add power to the pedal stroke.

The two most common pieces of advice from the engineering based solution are to pull up on the backstroke to keep even tension on the pedals and to place the ball of your foot over the axle of the pedal so you can push and pull through the ankle.

Both of these things make sense... in theory. If I was designing a machine from scratch to pedal a bike I’d have it pulling and pushing at the same time while also extending and pulling with every joint to add to the potential power.

The problem is that the human organism isn’t a machine and comes pre-wired with ways it likes to move. For example, when you push down hard with your lead leg there is an automatic activation of the muscles that retract the other leg. Your body is pre-hardwired for you to focus on pushing hard and letting the Passive Mechanics of the body reset the other leg to push down hard.

Runners know that and this is why they don’t try to add forward power with the return of the trail leg. They instead focus on simply driving their lead leg into the ground.


This idea of a movement vs. engineering based solution extends to foot placement as well. From the engineering perspective you would want the ankle to extend so you could push through the ball of the foot. Heck, it even looks like how you run or walk so it has to have some basis in movement as well, right?

Again, not so fast.
When you look at the foot and lower leg from a movement based perspective you see that there are two very different ways for
the lower leg to act.

The first is running, walking or jumping. In these activities you are wanting to move your center of gravity from over your base of support
so you can change position in space. These does require a push off through the fore foot to “jump” in order to break contact with the
ground so you can.

But this isn’t the only way that we move. We also need to move in a way where our center
of gravity stays on top of our base of support. Squatting and deadlifting in the gym are good
examples, as are bending over to pick up a box or standing up from a chair in the everyday
world.

When we move this way we want our feet to stay solidly planted to the ground for max-
imum balance, muscle recruitment and power transfer. We don’t want to come up on the
ball of the foot because it will actually decrease strength and balance.

The foot and lower leg act very differently in these two situations and so we should figure
out which most closely resembles pedaling so we can apply it. And when we are pedaling our
bikes we are not actually moving our center of gravity forward – we are pushing the pedals
away from us and the bike is carrying our center of gravity with it.

Pedaling your bike is much more like squatting or deadlifting than running or jumping. And
when you look at the lower leg and foot mechanics of this type of movement you see that you
do not want to be balancing on and pushing through the ball of your foot.
This is why you naturally go to a mid-foot position on flat pedals. If you don't have someone telling you that it is wrong and strapping your feet to where they "should" go most people would naturally find this foot position themselves and stick with it.

Your body, which is infinitely smarter than all of the experts who are “lecturing birds on how to fly” in this matter, instantly recognizes what they don’t – that you are far more balanced and powerful in that mid-foot position than you are trying to balance on your toes.

When you are squatting or deadlifting you want to keep your weight balanced on your feet. Your calf is helping to stabilize the ankle by isometrically contracting to help with the power transfer through the feet into the ground. If you try to have the calf stop stabilizing isometrically and ask it to move so you can push through the ball of your foot it will result in much less power and force being transferred into the ground.

So, this means that when we pedal our bikes we also want to have a mid-foot position. This foot position will automatically allow for better recruitment of the hips, which are the strongest muscles in the lower body and the real secret to pedaling power. You'll also be more balanced and stable when you stand up to pedal or get into the attack position for technical sections and downhills.

And since this mid-foot position doesn't require us to strap our feet into what your body recognizes as an unnatural position, it is yet another reason that you don't need clipless pedals. Anyone who tells you that you need them for finding the perfect foot position and forcing your feet to stay there is selling you an engineering based solution that doesn't work with your body's natural ways of moving.
Another problem with the engineering based solution for foot placement is that machines are inherently fragile and hate disorder. You want to smooth out as many rough edges as possible and look for symmetrical, repeatable movement.

But, like I pointed out earlier, the human body is not a machine, it is an organism. And organisms that move are inherently Anti-Fragile. This means that, up to a certain point, they actually benefit from some disorder and “noise”.

Your body literally uses this disorder to improve and when you try and take it away by smoothing out all the rough edges you actually fragilize the system.

In other words, your feet were never meant to be put in the exact same position every time they touch your pedals. They also aren’t supposed to be strapped down so they are in the exact same position for your entire ride. Yes, your feet working to maintain position uses more energy compared to strapping them into clipless shoes and pedals but that movement is needed to keep the system healthy.

Quick side note – this is another reason that I advocate that riders who do use clipless pedals still ride flats at least part of the time. It will keep your pedal stroke and skills sharp while also allowing for the feet to move more naturally.

This need for “noise” and disorder is something that the engineering based solutions doesn’t account for. Organisms thrive off of some disorder, machines break because of it and so there is a much different mindset and logic sequence used for each.

So don’t fall for someone trying to sell you on the need to find the “optimal foot placement position” and then forcing your foot in that exact same position every time you ride. This is actually much worse on the body than letting your foot have slight variations in how it is placed on the pedals despite the engineering based theories of how this “wastes energy”.

As you can see, how we answered the engineering based vs. movement based question led us to a very different view of where we should place our foot on the pedal. It is kind of like Alice’s rabbit hole – you can get sucked pretty far down it before you know it so make sure you choose the right one in the first place.
When you start to look at pedaling and maneuvering your bike as requiring a movement based solution you start to see things in a much different light. Instead of trying to force the body to move in a way it doesn't want to in the name of some engineering based theory, learn how to work with your body's natural ways of movement and apply them to the bike.

It will open up the door to much higher levels of performance and while placing much less wear and tear on the body in the process. BTW, I'm not the only coach who advocates this mid-foot position on the pedals. I can point to Joel Friel and Greg Choat as two other high level coaches who don't think pushing through the ball of the foot is the right thing to do.

As always I'd love to hear your thoughts so please feel free to leave a comment below this post. And if you liked this post please pass it along to a fellow rider or two who could benefit from the info.
Humans love metaphors. You know, where you compare something you know about to something you don't know about, which makes that something new easier to understand.

For example, telling you that something “tastes like chicken” is a metaphor. So is telling you that falling in love “feels like a roller coaster”. Or that riding your bike feels like…well, I'll let you fill in your own metaphor.

**If you think about it, we rely a lot on metaphors to help us make sense of the world.** And for good reason – they work great!

I use them a lot myself to help riders understand how certain exercises can help them on the trail. Once you understand how the hip hinge and body position connect to each other you’ll never look at either one the same way again.

However, metaphors have a downside. As great as they are for helping us quickly understand new things, *they can also be used to confuse people as well*. Since they are a substitute for actual knowledge and experience in an area, if the metaphor is faulty it can be hard for most people to catch it.

And this can lead to a lot of confusion about things.

**A great example of this is when discussing if you want to be on the ball of the foot or not when riding your bike.** One school of thought is that you need to be up on the balls of your feet because “that’s where you are in your athletic stance” and being “flatfooted” makes you less “agile”.

The problem is that while this sounds great, this is not a good metaphor. Most people who use this metaphor have never wrestled or played the sport they are referring to or else they would know that no one is out there just bouncing around on the balls of their feet.
In fact, you'd be hard pressed to find a picture of an athlete in this mythical “balls of the feet” position. For example, after looking around at pictures of wrestlers for this post I realized that none of them were on the balls of both feet. At best they would have one foot flat and be up on the ball of one foot but mostly you saw a lot of this:

As you can see, both of these guys are “flat footed” and yet they still look pretty “agile” and ready to move and respond. When moving around on the wrestling mat you spend a lot of time “flat footed” and rarely find yourself up on the balls of both feet.

When I brought this up with a guy who actually wrestles he laughed and said that being on the balls of your feet actually makes you less agile. He said that “you can't change levels on the balls of your feet”. And in most cases this reduces your movement options.

Now, don't get me wrong. Obviously being on the balls of your feet makes you more agile in some cases. If you are an infielder in baseball or a goalie in soccer and you are waiting for the ball to come at you then yes, this would be a good time to be in that position.

But even then, if the ball came right at you then you wouldn't stay up on the balls of your feet – you would drop your heels to field the ball.

Here's a guy named Derek Jeter – most people seem to think he was pretty good – showing us how being “flat footed” makes it easier to change levels and field a ground ball.

So, now that we've established that athletes in these metaphors already use the balanced foot position a lot more than you would thing, let me pose one more “challenge” to this metaphor...

Try doing a set of kettlebell swings on the balls of your feet. Or better yet, don't and just imagine how awkward that would be. You certainly wouldn't feel or look very “agile”.

Flat footed and ready to change levels.

Derek Jeter with his feet flat so he can change levels.
So why is this? If being on the balls of your feet makes you more agile then how come your body instinctively keeps your heels down a lot while moving or doing KB swings?

The answer is that being on the balls of the feet only makes you more agile in one narrow sense. If you need to get ready to run or jump then this position does make you more agile.

But if you need to change in your level and position— a.k.a. move your hips — then this foot position actually makes you less “agile”.

No one just stays on the balls of their feet all of the time. When you really think about it, most sports require a mix of being balanced on your feet to change positions and being on the ball of the foot to move once in those positions.

The big difference is that on the bike we never move our foot off of the pedal, we just need to be able to change hip position a lot. Again, since the foot doesn't break contact with the pedal during the pedal stroke it makes it unlike any other sport in the world.

In other words, some metaphors from sports that require position changes and movement – like wrestling, football or baseball – don't work. It can be like comparing apples to oranges, which leads to bad metaphors and confusion.

And bad metaphors have been used for a long time to explain why we do things in cycling that we now know don't really make sense. In this case, the truth is that using a midfoot position on your pedals will help you improve your ability to move around on your bike, not take away from it.

A more balanced, stable foot will help you tap into your body's own natural movement abilities instead of ignoring them. Riding mountain bikes is hard enough without handicapping yourself with bad foot position based on outdated metaphors that don't really apply to our unique sport.
5 Tips for Learning to Ride Flat Pedals

When learning to ride flat pedals you may suffer what is called “The Dip”. This is where you suffer a short term decrease in performance while you work on something new that will lead to substantial increases in performance when you get it down. It is very common in sports and one of the things that separate great performers in any category from everyone else is the desire to find better ways to do stuff and suffer through The Dip so they can continue to improve.

With that in mind here are some tips for helping you to minimize the dip and get to where you are able to ride flat pedals with more speed and confidence as quickly as possible.

1) Stick with them for at least 12 rides. You want to commit to riding flat pedals, and only flat pedal, for several rides in row as this will force you to learn how to use them. This is especially important if you have ridden clipless pedals in the past because the temptation will be to give up too soon and go back to them or to switch back and forth between clipless and flat pedals.

Use the tips in this manual and by your 12th ride you’ll probably be riding up and down stuff you’ve never cleaned before thanks to the kind of rider flats force you to become.

2) Stand up more. I am a huge fan of standing up more to pedal for several reasons, not the least of them is because it easier to keeps your feet “heavy” on the pedals. When you sit down you un-weight your feet and this makes it much more likely that you feet will fly off the pedals when you hit a rock or bump in the trail. This doesn’t mean that you need to stand up all the time but you should try to stand up when descending or laying down power to the pedals, which are the two most common times that most riders lose their feet on the pedals.

As an added bonus, standing up is much easier on the knees and lower back than being hunched over in the seated position. It also forces a co-contraction of the hamstrings and quads at the knee joint to stabilize it at the bottom position, which is something that doesn’t happen as effectively when you are sitting down. You should be able to go out on a 2 hour trail ride and stand up during all descents and most powerful pedaling efforts, using the seated efforts for when you can spin it out and recover for your next standing effort.
3) *Get some shin pads.* Keeping your feet planted on your pedals will require you to stand more and to actively "ground" your feet into the pedals, two skills that will take time to develop. Another skill you will pick up as you ride flat pedals is how to slip a pedal and get your shin out of the way.

In the meantime, just get some bright yellow shin pads and freak people out on the trail...oh wait, that's what I did.

You don't have to go with yellow but you will freak some people out when you blast by them on a climb with your flats and shin pads. Eventually you will get comfortable enough to ride without them but just be realistic about the fact that you will try to blow your shins up more than once.

4) *Use running to “reset” your pedal stroke.* This sounds a bit strange but one of the best drills I use at clinics to instantly improve a rider's pedal stroke plus make it more flat pedal friendly is to get them off their bike and run a few sprints. Several lab tests have shown that the vast majority of your power is produced on the downstroke and that the upstroke is primarily to get the trail leg back into position to drive down again, not to add power to the pedal stroke.

This is exactly how you run and by engaging the running mechanics you groove the lower body movement you need to pedal more effectively, especially when standing. Try sprinting 15-20 yards, repeating 4 times, and then jump on your bike and make your standing pedaling “feel” the same way - just be ready for an instant increase pedaling power and foot stability.

5) *Get a good pair of shoes and flat pedals.* This can not be stressed enough - most riders who say that they don't like to ride flat pedals have never tried riding with a good pair of flat pedals and shoes made specifically for flat pedals.

You should invest in a good pair of flat pedal specific shoes with a sticky rubber sole and a good pair of flats that are big enough to support the mid-foot position. Once you have the right equipment you'll be amazed at how much easier it is to keep your feet planted on the pedals.

As far as specific recommendations, I have tried just about every pedal and shoe out there and here are my top recommendations:

**Shoes:** I like the Freeriders and Spitfires from 5.10 and the Adidas Terrex. Both have the Stealth Rubber soles, which make a big difference in the the grip when things get rowdy or if your shoes get wet.
**Pedals:** I strongly feel that the mid-foot position is the best position for your foot on the pedals and so you want a pedal that is long enough to do this. Since most pedals are designed from the assumption that you want to push through the ball of the foot, almost every flat pedal out there is too short to support the mid-foot position properly.

The Catalyst Pedal from Pedaling Innovations is the first and only pedal designed to optimize the mid-foot position and optimally support the foot. By supporting both ends of the arch the Catalyst Pedal improves your power, balance and comfort on the bike.

To learn more about the science and movement principles behind the Catalyst Pedals, as well as read the reviews and testimonials from riders who have tried them, click on the link below.
Ryan Leach’s 12 Ride Flat Pedal Challenge (Free Instructional Series)

I wanted to share a valuable resource with you, especially if you are new to riding flat pedals.

Ryan Leech - who is one of the most talented all-around riders in the world - has put together a program called The 12 Ride Flat Pedal Challenge. In it he shares lessons and insights that can help you fast track your progress and skills on flat pedals.

Best of all, it is completely free to sign up for.

Just click this link to learn more and sign up.
Does This Video Really Prove That Flats Are More Efficient Than Clipless Pedals?

In a nutshell, these guys from Global Cycling Network posted a video last year telling people that a proper pedal stroke involves pulling up on the backstroke. In some of the feedback they got it was pointed out to them that there is no evidence for that and that the evidence we do have actually tells us that we shouldn't pull up on the backstroke.

The rider in the video sets up the test by saying that he doesn't agree with the results of those studies because he “feels” that he is applying force somewhere other than the downstroke. And to prove it they are going to do a test in both clipless pedals and flats to see if pulling up on the backstroke is more efficient.

The plan is for him to go about about 300 watts for 10 minutes and measure his heart rate, PRE, blood lactate levels and level of oxygen consumption. He'll go first on clipless pedals so he can pull up on the backstroke and then on flats so that he can't pull up at all.

Click here to read the full article.
Why Pulling Up Doesn't Add Power to Your Pedal Stroke

When looking at improving your performance on your bike one of the most important things you can look at is your pedal stroke. Improving your pedal stroke will help you produce more power and use less energy doing it, which helps you ride faster and longer.

This makes the pedal stroke a much talked about but often misunderstood subject. And the most persistent rumor about the pedal stroke centers on how you can “add” to your power by pulling up on the backstroke.

The idea is that by pulling up with the trail leg you can add to the power being generated by the lead leg, resulting in a more powerful pedal stroke. And while you may feel that pulling up on the backstroke helps, the truth is that it wastes energy and results in less pedaling power. The extra power that has been seen in some studies didn't come from pulling up, it came from a stiffer interface with the pedal [you can read this article for more on how clipless pedals really work].

When you look at how the body works you see that trying to “add” another muscle to a movement by consciously making it work harder doesn't result in more power. In fact, it usually results in less power and efficiency.

Your brain only has so much neural “juice” to put into an activity. When you call on that neural juice to get a muscle to work in an unnatural way it takes some of the neural juice that is going to the other muscles to focus on this new task. This loss in neural juice results in less power coming from those muscles, often much less than what the other muscles “add” back in.

A good example would be using the lower back when deadlifting. Top lifters know that using your lower back doesn't “add” to the overall power output; it results in less power because the hips lose more power than the lower back adds back in.

But you often see novice lifters using their lower back to get more weight off the ground, often with a weight belt to help compensate for it. They'll tell you that they can feel how lifting that way helps them and they will point to the lower weights they have to use when they don't as “proof” of the need to do it that way.
**Why Pedaling Efficiency Has Nothing to Do with Your Pedals**

Pedaling efficiency is one of those terms that gets thrown around a lot, especially when the discussion turns to flats vs. clipless pedals. One of the talking points coming out of the Clipless Pedal Mafia camp is that clipless pedals let you pedal more efficiently, which is a main reason that you are told you “need” them.

**Pedaling Efficiency is a very important part of mountain biking but it doesn’t have anything to do with the pedals you are using.**

The problem is that most of the people who repeat this term over and over again in defense of clipless pedals have no idea what it really means. And this makes it nearly impossible to have a rationale discussion about the subject when one side of the debate is using terms incorrectly.

So let’s break it down and look at what the term “Pedaling Efficiency” really means and how this understanding applies to how we train both on and off the bike.

[Click here to read the full article.](#)
6 Skills to Learn Before Considering a Switch to Clipless Pedals

There comes a time in every rider's life when they have to decide if clipless pedals are something that they want to try. And contrary to popular belief, I am completely fine with that... I have just as many riding buddies who ride clipless as flats. I've never said that flats are better than clipless pedals and for some riders, they can offer some advantages.

But what I don't like to see is for a rider to start using clipless pedals too soon and not take advantage of the lessons that flat pedals force them to learn. Too often a well-meaning fellow rider will see them struggling on the trail and suggest to them that getting clipless pedals will help them out. They know that being attached to the pedals keeps your feet from flying off and makes it easier to bunny hop so why not help a newbie by encouraging them to make the switch?
Are Clipless Pedals Enhancing Your Performance or Covering Up Your Dysfunctions?

Better is a relative term, especially when talking about artificial means of performance enhancement. The mistake people make is assuming that because something improves performance it must be better and therefore you want to use it all of the time. The fact is that equipment can either enhance good technique and fitness or cover up technique and fitness gaps and there is a huge difference between the two. The first will let you tap into your own abilities even more and the second will lead to plateaus and overuse injuries.

In mountain biking this is seen in the rampant use of clipless pedals but ours is not the only sport that has this problem and we can learn something by looking at the parallels between our situations. In fact, the best analogy to explain this concept is the use of a weight belt when squatting or deadlifting.

Using a weight belt will help you lift more weight, which technically makes it “better” from a performance point of view. However, anyone who knows anything about strength training knows that you don’t use a weight belt all of the time. You save it for when you need it but, on average, 80-90% of your lifts should be without it.

Once you can ride almost as well on flats as you did on clipless go back and try clipless pedals again and I’ll bet you see a big difference in how effectively you can use them.
Why Clipless Pedals Don’t Really “Connect” You to Your Bike

One of the more common reasons I hear from riders about why clipless pedals are better or needed is because they “connect” or “attach” you to the bike. However, I think that there is a difference between being “connected” to your bike and being “attached” to it. The two have nothing to do with each other and this causes confusion when discussing the pro's and con's of either pedaling system.

To make my case I point to trials riders like Ryan Leech and Danny McCaskill. You can’t tell me that they don’t feel connected to their bikes yet they are not mechanically attached in any way. Connecting with your bike happens at a subconscious level and has nothing to do with having your feet attached to the pedals.

However, to connect with your bike you must first connect with yourself. If you don’t have the body awareness needed to intentionally apply strong movement to the trail then there is no way you can connect with your bike, at least not at the same level you could.
The Science and Movement Principles Behind the Mid-Foot Position

Some people may wonder why I care so much about foot position on the bike.

I mean, does it really matter that much? Can't we just ride what feels good and call it “personal preference”?

Well, foot position does matter... a lot. Your foot is constantly sending feedback to the brain and it plays a huge role in your balance, movement efficiency and power generation.

So I guess you could say that foot position only matters if things like balance, movement efficiency and power generation on the bike matter to you.

Joking aside, it is extremely important and there is a "right" and a "wrong" foot position to use on the bike. When you use the right foot position you can create authentic movement the body works for you, when you use the wrong one it creates compensations that cause unbalanced positions and wasted energy.

The problem, though, is that in today’s world most people have weak and “dumb” feet that have spent way too much time inside shoes and sitting around doing nothing. And when you come into mountain biking with feet (and other things) that need help it can make it confusing about which is the best foot position based on authentic movement and not just a compensation that looks better.

Click here to read the full article.
Applying Functional Movement to Your Bike - Interview with International Bike Fit Expert Greg Choat

In this episode of the MTB Strength Coach Podcast I talk to Greg Choat who is one of the top bike fit professionals in the world – yes, I said a bike fit guy! I ran into Greg at a Functional Movement Screen Lv. 2 seminar a few weeks after running my blog post on the real value of bike fits and found out that he actually shares my feelings on the subject. After hearing more about how he uses the FMS to enhance his bike fits I knew that I had to get him on the podcast to talk more about it.

In this interview we talk about how the FMS has changed how he views and uses bike fits, how our everyday lives affect the dysfunctions we bring to bike, how those dysfunctions affect how we perform on the bike and why the bike industry in general has missed the boat on applying functional movement to the bike in favor of marketing hype.

We also talk about pedaling technique and why strength training, especially the deadlift and swing, are essential to building a strong, efficient pedal stroke. Grip strength and neck pain come up as well – in short, we cover a lot of ground and this is a “must hear” podcast from one of the top cycling coaches in the industry.

Click here to listen to the full podcast.
Why Flat Pedals are Better Than Clipless for Off Season Training

What if I told you that I had a training tool that was guaranteed to improve the efficiency of your pedal stroke and trail skills? Better yet, what if this training tool costs less than $150, could easily be installed in less than 5 minutes and started to deliver noticeable results in just a few rides?

Well, if you didn't know where this was going already you would probably be pretty interested. Who knows, maybe you still are. Most riders I've asked this question to certainly were.

But then comes “the catch”…as you have probably guessed this amazing training tool is a pair of flat pedals.

And this is where I start to lose a lot of those same riders who were very curious just a few seconds earlier. The thought of flat pedals being better to use during training than clipless pedals is a really strange concept to a lot of riders.

When seen from the viewpoint of Forced Efficiency Training, it makes no sense to spend all of your training and riding time on clipless pedals.

Click here to read the full article.
We’re all born being “cursed” in certain ways. While I know that you can make significant changes with some focused effort it still seems like some things are more of a struggle than others.

For me, well, among other things I can’t dance, I’m terrible at remembering names and I have this compulsion to call bull shit when I see it. And it is this last “curse” that has landed me in so much trouble over the years.

I know this may shock some of you but I’ve actually been fired from jobs because I said something that was true but not politically correct. I’ll just never understand why you wouldn’t want to just be honest about how things are.

Pretending that things aren’t what they are doesn’t change them so why not just admit that things are what they are and move on?

For example, why do we keep pretending that new riders actually have freedom of choice when it comes to deciding between flats and clipless pedals?

Whenever I bring up flat pedals and how a lot of riders would benefit from some time on them I often hear from a clipless pedal backer with the “you just need to let people ride what they want to ride” argument.

If you took that magical pedal stroke off the table and you knew from day 1 that you could pedal, bunny hop and maneuver your bike just as well on flats as you could on clipless pedals would you really feel as compelled to use them?
Is the Lie That You Need Clipless Pedals Driving Away Thousands of Riders Every Year?

Before I start in on my rant let me share a real life conversation I had a few months back with one of the guys I do BJJ with...

Hey man, nice bike.

Thanks, do you ride?

I bought a bike last summer but I only rode it 3 or 4 times.

You planning on riding more this year?

I don't know. I didn't have much fun on the rides I went on and I fell over a lot. I can't afford to get hurt so I kind of stopped riding.

Let me guess, you were on clipless pedals.

Of course. The guys at the bike shop said that I would need them so I might as well get used to them right away.

Well, that's not really true. You see... (at this point I went into the TRUTH about clipless vs. flats).

You mean I don't need those things? Well, that sounds a lot more fun. I'll have to get some flats and get out there again.

So, what is the point of this story?

We were going to lose this guy as a rider because as a new rider he was (rightly) scared of trying to learn to ride on clipless pedals.

And this isn't an isolated incident by any stretch of the imagination.

I've gotten dozens and dozens of emails from riders around the world with similar stories. They were getting ready to quit mountain biking because they were tired of feeling scared and timid on the trail and they didn't want to get hurt. Or they had gotten hurt as a direct result of not being able to unclip and had begun to question if it was really worth it.
How Flat Pedals Improve Your Riding - Interview with MTB Star Ryan Leech

One of my most popular podcasts interviews over the last few months was with trails rider and overall mountain biking stud Ryan Leech. At the end of our conversation I mentioned something offhand about flat pedals the tragedy of seeing new riders forced into the so quickly and Ryan was in both total agreement as to the need to learn how to ride on flats and surprised to hear that clipless pedals were being pushed so hard onto new riders.

Ryan was nice enough to join me for another podcast and in this one we dive into the use of flat pedals and how they enhance your balance, pedal stroke and skills as a rider. More importantly they enhance the FUN factor, which sometimes riders forget about. Ryan also gives us his advice for riders looking to make the switch from clipless to flat pedals and what you need to look for in a pedal and shoe to make it work.

All in all, Ryan does a great job of dispelling a lot of myths surrounding clipless pedals and reminds us that if trials riders – the most technically proficient riders in the world – don’t need to be attached to the pedals then few of us really do.

Click here to listen to the full podcast.