Pedal Power

FREEDOM OF CYCLING AFTER AMPUTATION

By Brenda McCarthy

Cycling is more than just a sport or mode of transportation. It's a pathway to freedom, independence, and joy. For amputees, the prospect of cycling can be both exciting and intimidating but with the right tools, support, and mindset, barriers can be overcome for a new sense of adventure. Here are some important steps and practical advice to guide you through the start of your cycling journey and to discover its joys.

The benefits of cycling are plenty. As a low-impact exercise that provides immense physical, mental, and emotional benefits, cycling improves cardiovascular health by strengthening our heart and lungs, and improving overall endurance. It encourages core muscle use and improves balance and stability, important factors for amputees. Riding outdoors is known to reduce stress, enhance mood, and promote better mental wellness. And it offers an opportunity for social interaction – joining cycling groups fosters connections and a sense of belonging.

STEP 1
Evaluate Your Readiness

Before hopping onto a bike, it's essential to assess your physical condition and readiness. Consult with your healthcare team and prosthetist to ensure that your residual limb is up for the task. Explore adaptive equipment or therapies to support your cycling goals. Build stamina on a stationary bike, gradually increasing time and intensity and smoothing out your pedaling motion. Pay close attention to how your residual limb feels and how your prosthesis is performing.

PHYSICAL PREPARATION

- **Find exercises that build strength and flexibility in your core and sound limbs.**
- **Work with a physical therapist to build better balance and coordination.**
- **Practice weight-bearing activities to prepare for the cycling motions.**

STEP 2
Choose the Right Equipment

Cycling after an amputation requires equipment tailored to your needs to ensure comfort, safety and efficiency. Visit a bike shop to experiment with different bike setups and to find out what they can do to adapt a bicycle for your needs. Seek advice from your prosthetist too, and consider socket liners or cushioning for comfort on long rides. Discuss any discomfort that you experience, as this signals the need for adjustments. Consider socket tweaks for easier knee bending and explore different knee joints. There might be sport-specific options designed for the type of cycling you want to do. As your comfort and skills progress, experiment with secure foot attachments like straps, toe clips, or clipless pedals. And… invest in a quality helmet to protect your head.

TYPES OF BIKES

- **Handcycles: Ideal for lower-limb amputees. Powered by hand pedals. Excellent control.**
- **Adapted bikes: Conventional bikes modified with prosthesis-friendly pedals, stabilizers, or seating.**
- **Recumbent bikes: Extra balance and comfort. Added support.**
- **Tricycles and e-bikes are also great options.**

STEP 3
Start Slow and Build Confidence

Embarking on your cycling journey might take some patience and gradual progress. Start with short rides in safe environments such as parks, trails or quiet neighbourhoods. Get comfortable mounting and dismounting your bike. Practice pedaling and steering at a slow pace to build confidence. Focus on balance, especially if using a traditional or adapted bike.

Begin with achievable milestones, such as riding for 10 minutes or covering a short distance. Gradually increase your ride time as you grow more comfortable and confident. It's normal to encounter obstacles, whether physical, emotional, or technical. Seek support when needed, and celebrate every success. Remember, progress is a journey, not a race.

STEP 4
Join a Community

Cycling is as much of a social activity as it is an individual pursuit. Joining a community of cyclists can provide motivation, encouragement, and camaraderie. Research cycling clubs in your area that welcome adaptive cyclists. Many groups provide mentorship and group rides tailored to diverse needs. Find an online forum or community dedicated to adaptive cycling. Share experiences, ask for advice, and draw inspiration from others' journeys.

STEP 5
Embrace the Freedom

Cycling is more than a physical activity – it's a liberating experience that empowers you to explore new horizons. Embrace the freedom it offers and take pride in your resilience and determination.

MAINTAINING MOMENTUM

- **Incorporate cycling into your routine as a regular activity.**
- **Continue setting personal goals to challenge yourself.**
- **Stay connected with your cycling community for ongoing support and encouragement.**

Starting to cycle with an amputation is a journey of courage, adaptation and triumph. With the right preparation and support, you can overcome barriers and rediscover the joy of riding. So, gear up and ride forward into a world of possibilities — you've got this!

Amputee Cycling Guide

RIDING A BIKE WITH A PROSTHESIS

By Eddie Zepeda
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Cycling isn't solely about legs – it's a full-body experience offering a sense of freedom, fitness and the pure thrill of the ride! While limb differences present unique challenges, understanding those challenges is the key to finding the perfect adaptations and techniques to unlock your full cycling potential.

While cycling with an upper limb amputation often requires some adaptation, it's absolutely possible to experience the freedom and joy of this exhilarating activity with the right modifications. While unique challenges exist, the right prosthetic choices, customized bike adaptations, and a determined spirit will propel you forward. Let's explore some solutions to overcome common hurdles and unlock the full joys of cycling.

With a well-fitting prosthetic device, you'll discover the joy of the ride! Let's dive into specific equipment considerations for each level of amputation.

Cycling for Upper Limb Amputees

Here are some common challenges and potential solutions.

- **Grip and Control:** Gripping the handlebars and managing brakes and shifters can be difficult. Solutions include customized grips, prosthetic attachments, and handlebar modifications (like foot-driven brake set-ups). Consider voluntary opening hands or hooks, or custom attachments designed for secure handlebar grip, and brake and gear operation. Partner with your prosthetist and a bike shop specializing in adaptive cycling to find the perfect solutions. Explore streamlined one-handed brake and shifter modifications.
- **Balance and Stability:** Cycling with one hand requires good core strength and balance for control, especially on turns and uneven terrain. Start with a stationary bike to build confidence and strengthen your core. Consider auxiliary handlebars for added support.
- **Prosthetic Fit and Function:** A comfortable, well-fitting prosthesis is essential. Collaborate closely with your prosthetist to ensure optimal fit, explore grip options, and make cycling-specific adjustments.
- **Prosthetics for Cycling:** Work with your prosthetist to ensure that your prosthesis provides both comfort and secure functionality for confident cycling.

Tailoring your bicycle for a comfortable and empowering cycling experience is important too. Most upright bicycles are suitable for upper limb amputees with good core and upper body strength. Tricycles offer an alternative for those needing greater stability. Handcycles and recumbent bikes use hand cranks for propulsion, making them an option for upper limb amputees or those with limited leg mobility. They come in various styles, from sporty trikes to stable quad cycles – a lot of options!

Seat considerations are important too. A supportive backrest can provide stability for those with limited core or back strength. Integrated lumbar support in the seat helps maintain proper posture, reducing fatigue and maximizing your cycling enjoyment.

Cycling with an above-elbow amputation requires adaptability and determination, but the rewards – freedom, fitness and personal growth – are immeasurable. With the right prosthetic components and bike adjustments, and an unwavering spirit, above-elbow amputees can experience the joys of cycling too. Your prosthetist is your greatest ally in unlocking your cycling potential! Explore options for above-elbow prosthetic devices and attachments designed to maximize grip and control. Body-powered prostheses offer durability, while myoelectric options provide a wider range of grip control. For increased stability, discuss the benefits of an elbow unit with locking capabilities.

Cycling for Lower Limb Amputees

Cycling with a below-knee amputation can be achieved with your standard walking prosthesis, but there are still important factors to address. Prioritizing a secure socket fit, proactive care for your residual limb, and exploring foot attachment options are key for enjoying long, comfortable rides and reaching your cycling potential.

Finding the perfect bike is your gateway to enjoyable and accessible cycling as a lower limb amputee. Choose the bike type that puts comfort, effortless mounting, and a personalized fit at the forefront of your experience.

- **Low-Entry Bikes:** Say goodbye to awkward mounting! These bikes let you swing your leg effortlessly over the saddle. They're especially good for above-knee amputees.
- **Recumbent Bikes:** Cycling reimagined – that's the magic of recumbents! With its laid-back design and ample back support, these bikes prioritize comfort. They minimize pressure on your lower back, letting you cruise in complete relaxation.

Seat considerations for lower limb amputees are also important. A slightly wider seat offers stability and distributes weight evenly, providing a sense of built-in support. Ample padding is crucial for preventing discomfort in sensitive areas. Gel or memory foam inserts add a layer of plushness, making those long rides even more enjoyable. Specialized seats (saddles) feature a cut-out to reduce pressure, which can be especially beneficial for amputees whose prosthesis may not fully conform to traditional seats.

For above-knee amputees, priorities will be maximizing power transfer, ensuring optimal prosthetic knee mobility, and a focus on comfort throughout long, exhilarating rides. With the right prosthetic components, cycling-specific adjustments, and a focus on technique, the transformative power of cycling awaits.

For upper extremity amputees, simple bike adjustments can make a world of difference in your safety, endurance, and cycling enjoyment. Seek out a bike shop specializing in adaptive cycling for expert guidance with:

- **Handlebar Grip:** Non-slip grips, larger diameters, or extensions designed for a secure hold.
- **One-Handed Control:** Modifications can streamline brake and shifter operation to a single side of the handlebars.
- **Extra Support:** An auxiliary handlebar provides an additional gripping point, maximizing stability.

- **Bar Ends:** Extensions offering multiple hand positions, reducing fatigue during longer rides.
- **Mirrors:** Navigate traffic with greater confidence.
- **E-Bikes:** Consider the extra support an electric-assist bike provides on challenging terrain or for fatigue.

To optimize knee function, enhance power transfer, and ensure a comfortable, empowering cycling experience, here are some considerations:

- **Power Transfer:** Focus on developing a smooth, efficient pedaling motion. Work with your prosthetist to explore specialized components designed to maximize power transfer.
- **Knee Flexion:** Collaborate with your prosthetist to ensure that your prosthetic knee joint allows for a comfortable range of motion while cycling. Discuss specialized cycling-specific knees that can enhance the natural feel of your pedaling.
- **Socket Comfort:** A well-fitting prosthetic socket is crucial for cycling success. Work with your prosthetist to achieve a precise fit, paying particular attention to comfort during the pedaling motion. Consider a lowered posterior brim in your socket for easier knee flexion.

Key Factors for Above-Knee Amputees

From your prosthetic knee joint to your foot connection, these factors can transform your cycling experience.

- **Knee Joints:** Discuss options with your prosthetist.
- **Standard Knees:** Consider single-axis knees for stability or polycentric knees for more natural movement.
- **Cycling-Specific Knees:** Explore designs with different modes optimized for road, mountain, or leisure cycling.
- **Prosthetic Feet:** Your prosthetic foot plays a vital role in your cycling experience. Standard feet, your everyday prosthetic foot, can provide a solid base for casual cycling. Flexible feet offer greater dynamism and improved responsiveness to changing terrain, enhancing your pedal control. And if you're passionate about cycling, consider specialized feet designed for high-intensity workouts or competitive endeavours.
- **Physical Therapy:** Build strength, flexibility, and range of motion to enhance your cycling power and overall experience. A physical therapist can design a targeted plan to overcome cycling-specific challenges.

Pedal Connection

Foot/pedal interface is another biking big decision. Experiment to find the ideal set-up for stability, control, and power transfer. Explore secure attachment methods like straps, toe clips, or clipless pedals. Your prosthetist can guide you toward the best option based on your experience level and cycling goals.

Flat pedals offer simplicity and adjustability, making them perfect for beginners or casual rides. Straps and toe clips are more secure, providing better connection and power transfer as you build strength and confidence. Clipless pedals are the ultimate connection! Clipless systems maximize energy transfer and stability – ideal once you're comfortable with cycling.

Collaborate with a bicycle fitter or your prosthetist to analyze your pedal stroke. Even slight adjustments to your prosthetic foot's alignment on the pedal can significantly optimize your power and comfort.

Enjoy the Ride!