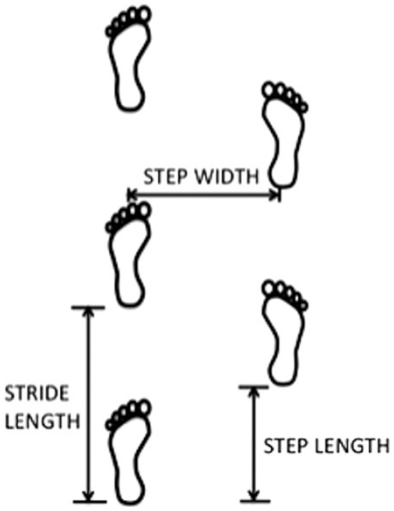
AAHKS Patient Education Committee

Gait Training After Joint Replacement

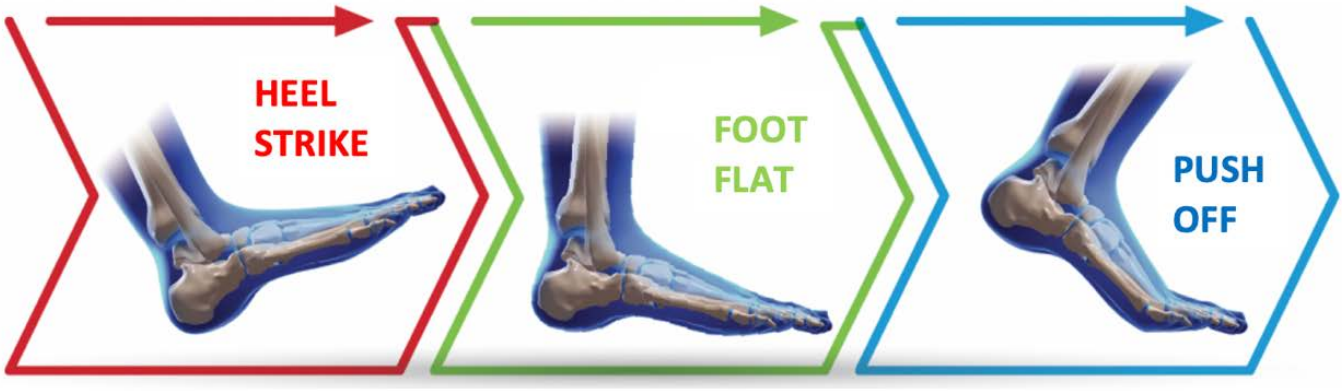
What is Normal Gait?



Gait refers to your pattern of walking. Normal walking should be **consistent**, **effortless,** and **pain free**. When you have a bad hip or knee your gait can change leading to more pain and require more energy to get from one point to another (walking with a limp can be exhausting). Recovery after your joint replacement can lead to an altered gait pattern that will get better with exercises (Stretching, Strengthening, Endurance training, and Balance – examples can be found at www.aahks.org/hipknee). Therefore, it is important for you to be mindful of your gait and work to help normalize your walking pattern during recovery.

Have you ever looked back at your footprints in the sand or snow? You probably noticed your steps were just about the same width and distance apart from each other no matter how far you walked. We can classify gait based on the pattern of steps you make during walking. When studying gait, certain terms come to mind: step length, stride length, and cadence. **STEP LENGTH** refers to the distance between the heel of one foot striking the ground and the heel of the **opposite foot** making contacting the ground. Meanwhile a **STRIDE LENGTH** refers to the distance between the heel of one foot contacting the ground and the distance it takes for the **same heel** to contact the ground again. Typically, a person with longer legs has a longer stride length. **CADENCE** is the number of steps a person can take per minute. A bad hip or knee can cause cadence to decrease. A normal cadence is between 100-115 steps/minute.

During normal gait your heel strikes the ground first followed by your foot becoming flat on the floor before pushing off with your toes just before swinging your leg forward. These three simple motions are key to developing a more normal walking pattern after a joint replacement. This is why your therapist tells you "**HEEL-TOE-LIFT**" again and again during your recovery.



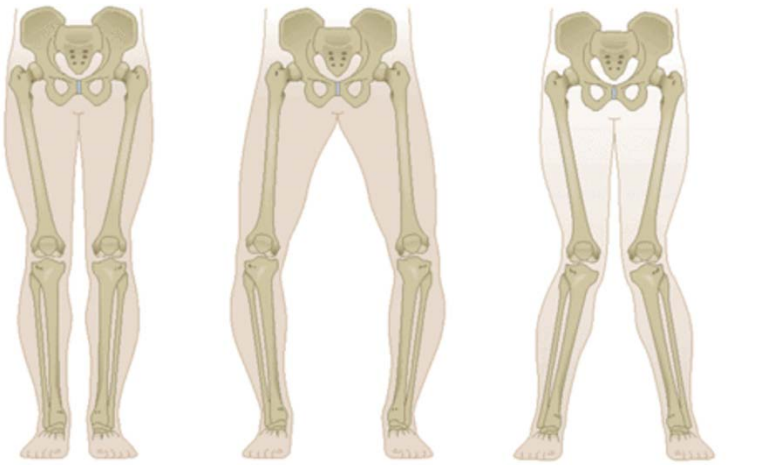
Gait Training

Before surgery your gait is often abnormal, usually due to pain and weakness that accompanies a worn-out hip or knee. After surgery the pre-operative pain is gone but you have to work to retrain your muscles to function normally again. The science of gait training is complex and relies on your brain and nervous system coordinating muscles to contract and relax at specific points during walking. It all starts with you keeping in mind a few key points. For starters, we recommend wearing a good supportive athletic shoe with laces to make sure your shoes are secured to your feet. You should not practice walking in flip-flops, sandals, or slippers for safety reasons. Loose footwear can lead to injury, falls, and make it hard to practice proper gait mechanics.

Next, we usually have patients recall the above pattern of normal gait: "**HEEL STRIKE, FOOT FLAT, PUSH OFF WITH YOUR TOES".** Reciting this phrase during gait training is good to reinforce correct technique.

It helps to practice your gait in front of a mirror to get immediate feedback about your walking pattern. Some patients find it helpful to record their gait on a smartphone video app as a way to track their progress. Remember your toes should always point forward during walking. As your muscles get tired, you may notice your toes start to rotate outwards – it is important to look for this pattern and focus on keeping your toes pointing forward to continue to build your strength and endurance.

Early in your recovery process, you may learn to walk with an assistive device (walker, crutch, or cane). It remains important to practice a normal walking routine. When using a cane or crutch it is important that you hold the device in the hand **OPPOSITE** of your hip or knee replacement. When your operative leg contacts the floor the cane/crutch hits the floor at the same time to keep you balanced. Such walking can be tiring because the last time we had to concentrate on walking we were infants!



NORMAL **VARUS (BOW LEGGED)** **VALGUS (KNOCK KNEES)**

During a joint replacement, your surgeon corrects a deformity to realign your hip or knee joint. As a result, the operative leg may feel longer than your opposite leg after surgery. This is because some of your leg muscles have not been working "normal" for several years and a joint replacement changes your leg alignment to the point that your muscles need time to adjust to their new configuration. Focusing on your exercise routine and gait training area usually all that is needed for your leg length issue to resolve itself. This process usually takes **3-6 months**.

Gait training usually starts on flat and even surfaces before progressing to irregular ground or inclines/declines. Sometimes riding a stationary bicycle helps to get your legs ready for walking because pedaling helps to replicate a consistent walking pattern. Walking on a treadmill allows you to carefully adjust the speed and incline to further challenge your recovery. Pool walking in chest-high water can also help to unload painful or weak joints to allow you to practice a proper gait mechanics.

Summary

A consistent exercise routine is important to recovery after a hip or knee replacement. Stretching tight muscles and strengthening weak muscles forms the foundation of recovery but gait training helps put everything together to function as a complete unit. Rest, ice, anti-inflammatory medications, and topical creams can help to decrease muscle soreness, pain, and swelling after exercising. Rehabilitation is a long process but there is light at the end of the tunnel.

This document provides an overview of developing a gait training routine. Please visit the American Association of Hip and Knee Surgeons (**AAHKS**) patient education website (www.hipknee.aahks.org) for additional exercise handouts to use during your recovery after your joint replacement.

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DISCLAIMER

PLEASE USE THIS HANDOUT AS A GUIDE AS IT IS ULTIMATELY BETWEEN YOUR AND YOUR SURGEON TO DECIDE WHICH THERAPY SETTING IS RIGHT FOR YOU. YOUR SURGEON MAY RECOMMEND ALTERATIONS TO THIS ROUTINE. IF YOU EXPERIENCE ANY ABNORMAL DISCOMFORT, DIZZINESS, OR FEELINGS OF PASSING OUT, STOP EXERCISING AND CONTACT YOUR PHYSICIAN AS SOON AS POSSIBLE.