

## Swelling Issues and Polio Survivors

Why we need to take it seriously.

By Dr. William DeMayo, MD

[DeMayo's Q&A Clinic](#)

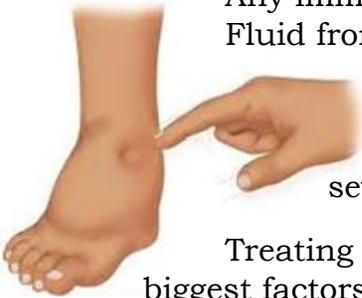
**Question:** Dr. DeMayo - My right leg has always been very thin. It's now terribly swollen from the knee down, and feels extremely heavy (I'm having trouble transferring into the shower). The doctor did an ultra sound to rule out blood clots. It was negative. I've been using a power chair for 18 years. What should I do?

**Response:** This is a great question that pertains to many polio survivors. Before addressing the issue of swelling itself, I want to acknowledge and endorse the evaluation of unilateral swelling with ultrasound to rule out blood clots (Deep Venous Thrombosis-also known as DVT). Given that a DVT in the leg can break off and travel through the heart to the lungs, it is a potentially life-threatening condition that is easily diagnosed using this technology that involves soundwaves (like sonar). Venous clots are most common in someone who has recently become sedentary or has had an injury followed by unilateral swelling. Although they are less common in the chronic setting, it is a diagnosis that should never be missed. This reinforces the general concept in healthcare management to be sure and rules out the most serious causes, especially if diagnosis is easy. It is also important to rule out other common causes of swelling such as congestive heart failure or kidney failure but these typically present with swelling in both legs. Unilateral swelling can also infrequently be caused by issues such as tumor obstruction to blood flow. In any case, it is always important to discuss swelling with your physician before concluding it is benign.

With the above said, the most common cause of swelling in polio survivors is “dependent edema”. Swelling in the feet and lower legs accumulates due to gravity. The heart pumps fluid to the feet, but physical activity needs to pump the fluid back. Contracting muscles literally squeeze the blood in veins towards the heart and valves prevent the blood from moving back.

Any immobility, paralysis, or sedentary behavior will limit this pumping action.

Fluid from the accumulating blood seeps into surrounding tissues leading to edema. The extent of edema in the tissue is assessed by pressing for several seconds and evaluating if “pitting” of the tissue occurs where fluid is pressed out of the area. The more pitting there is, the more severe the problem.



Treating lower extremity edema centers around minimizing the effect of the three biggest factors that exacerbate swelling: **S**itting, **S**edentary lifestyle and **S**alt.

- **S**itting

Gravity makes it more difficult to return fluid to the heart and increases the chances that edema will accumulate in the legs. The lower the feet are relative to the heart the greater the hydrostatic pressure that needs to be overcome and returning blood to the heart. Furthermore, resistance at the knees and hips in a bent sitting posture can make this return of blood even more difficult. Unfortunately, the opposite is also true if the feet are at the level of or above the level of the heart then it is easy for fluid to return. Most people wake up with less edema in the morning. Elevating the feet above the heart as much as possible will result in further reduction in swelling. **If** there are no heart problems or other contraindications, a brick under the foot of the bed, can result in fluid slowly moving out of the feet into the general circulation over the course of the night so it can be excreted by the kidneys. This effect of this small elevation can be illustrated if one thinks of water on a flat surface; it doesn't take much elevation of one side

## Swelling Issues (continued . . .)

to get the fluid to flow to the other side. The slight elevation is compounded over the long duration we are typically in bed at night.

During the day, support socks/stockings can often help prevent fluid from accumulating when an individual is sitting. Support stockings can range from over-the-counter support socks from Walmart to custom stockings prescribed by a physician.

Donning these socks can be problematic. This is especially true if there is upper extremity weakness. A sock-aid is a plastic sleeve with a rope pull that can be quite helpful. Despite this aid, many people abandon compression socks as being impractical. I have always found Tubigrip



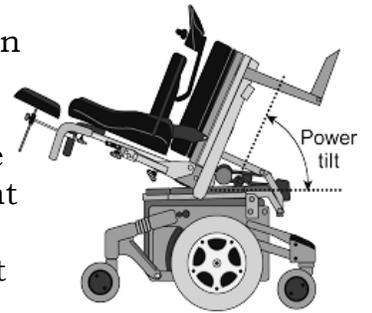
to be a helpful alternative to stockings - it is a tubular bandage that has enormous elastic qualities.

A double layer from the toes to the knees is usually easy to slide on and well-tolerated. Moderately severe swelling usually requires size E. A roll can be obtained on the Internet through [Amazon](https://www.amazon.com). Some providers also sell it by the yard.



For individuals who do not respond to static compression sequential compression pumps are available by prescription (see your doctor). In some cases, these devices can be very helpful. They involve use of an inflatable "boot" with several chambers. A pump inflates the chambers in the foot, then the ankle, then the lower leg pushing fluid back towards the heart. Treatment usually takes a couple of hours a few times a week.

For those who are using a power wheelchair, lower extremity edema can be dramatically improved with a "tilt in space" option. A "tilt in space" option requires specific medical documentation to be provided to the insurance company. As the head and upper body move down, the feet are raised and the hips and knees are maintained at 90°. This is very different than reclining (when the feet stay at floor level). Tilting periodically throughout the day can drain fluid from the feet and dramatically prevent accumulation.



### • **S**edentary Lifestyle

Many polio survivors have significant impairments in mobility. For those who are able to walk, even short walks multiple times per day can be of significant benefit in preventing swelling. While walking is clearly the best activity to facilitate muscles pumping fluid back to



the heart, any contraction of these muscles will help. "Ankle pumps" are exercises that are often taught to all patients on rehabilitation units to prevent swelling and clots. They can be done in bed or wheelchair and simply involve forceful contraction of the calf muscles while pointing the toes down followed by pulling the toes up towards the body and repeating multiple times

throughout the day. It is helpful to think of this like pumping the handle on a well to move fluid. Many polio survivors with severe atrophy in the lower leg may simply not have the muscle mass to "pump" the fluid. If atrophy is only in one leg, it is typical to see swelling mostly on that side.

### • **S**alt

Kidney failure leads to swelling because salt is not excreted in the urine. To keep the concentration of salt normal in the body, we then retain more fluid to dilute the salt. Most of us, especially as we get older, can see this impact even without kidney failure. Eating salty chips, soup, or other foods high in sodium can dramatically affect edema for many individuals. Evaluating sodium intake is the first step in preventing this. Talk to your doctor if the swelling

continues. Physicians may recommend a "Water Pill" (Lasix, hydrochlorothiazide, or others). If one is prescribed, it is best taken the morning to avoid interfering with sleep.

Leg swelling is more than a cosmetic issue or inconvenience and donning shoes and socks. Edema can reduce blood flow to the skin and increase the chances of infection. Additionally, the sheer weight of the fluid can severely impaired function in individuals who already have weakness. Excess fluid in the legs can add up to 10 or 20 pounds of "deadweight" and lead to fatigue over the course of the day or inability to climb stairs, transfer into the tub or get in a car. Think about the impact of putting 10 pound weights on one's ankles for the entire day. Furthermore, over weeks and months this can also result in functional decline leading to a more sedentary lifestyle and a vicious circle. Conversely, removing a significant amount of edema can often improve function. A minor amount of swelling is very common and may not be problematic but moderate or severe swelling is almost always important to address with your physician. For cases that did not respond to the above suggestions, Lymphedema clinics are available. My experiences have been that many of these clinics provide short-term benefit with edema returning after treatment concludes. If, however, they can get swelling down so that compression stockings can be used then long-term management can be achieved.



I encourage Polio survivors to continue to pursue treatment of moderate or severe edema (swelling) until a customized approach is developed that meets their needs. In most cases that includes a combination of approaches with input from a treatment team including a rehabilitation physician, primary care physician, therapist, and nurses.

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