

Ask a Post-Polio Specialist #1

With Vance C. Eberly, M.D.

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Dr. Eberly has been the orthopedic specialist in the Rancho Los Amigos Post-Polio Clinic since 2001. He sees Rancho patients every Friday afternoon; he also has a private practice. Dr. Eberly's association with Rancho Los Amigos began as a young resident working in the post-polio clinic with the famous polio specialist Dr. Jacquelin Perry. Although Dr. Perry is officially retired, she visits the Rancho Los Amigos campus and its post-polio clinic weekly and Dr. Eberly continues to consult with her then.

This report is based upon to Dr. Eberly's answers to pre-submitted questions at the Rancho Los Amigos Post-Polio Support Group meeting on December 6, 2008. Many subjects were covered including rotator cuff tears, grading muscle strength, exercise guidelines, osteopenia, osteoporosis and calcium replacement, bone density testing, muscle strength and aging, and the treatment and prevention of muscle overuse.

Q. What can I do to alleviate or prevent upper arm pain?

This arm pain seems like it could be related to a torn rotator cuff.

Rotator Cuff Tear

One of the hallmarks of a rotator cuff tear is shoulder pain that is worse at night. Usually the cause of rotator cuff tear is a spectrum; it starts out with weakness in your rotator cuff, which causes impingement (rubbing of the tendon on the bone in the shoulder), and over a period of time it wears through and tears it. You don't need to have had polio to have a weak rotator cuff.

The rotator cuff consists of the deep muscles in the shoulders which are not used as much as the big muscles. So over time, a person develops muscle imbalance in the shoulder. When you lift your arm up, instead of the ball and socket joint rotating smoothly, the big muscles pull it up and it rubs. Over time it becomes a wear and tear problem.

Recommendation: See an orthopedic surgeon, have an evaluation and check the rotator cuff strength, and ultimately get an MRI to evaluate the rotator cuff. Is there a panacea for this person? A steroid injection in that shoulder will probably provide some significant temporary relief. The rotator cuff tear is up in the shoulder but the pain is in the arm.

Q. What is current thinking about exercise in post-polio syndrome?

Before discussing exercise, let's review how we grade muscle strength.

Muscles are graded from zero (flaccid paralysis) to five (normal strength). This is not a linear scale. So when your strength goes from grade 5 to grade 4 you have actually lost about 50% of the strength in that muscle. When you drop to grade 3 you have lost another 50% and are then down to 25% muscle strength. Keep in mind that activities of daily living (ADL) do not require grade 5 muscle strength because you are not working at maximum efficiency all the time. Grade 3 muscle strength is all that is needed for ADLs. When you go down in strength, you are going down in endurance as well.

Exercise Guidelines

The rule of thumb is that if you have grade 3 muscle strength you really should not be doing an exercise program because ADLs are exercise. If you go above and beyond that, the muscles can get overworked, and there can be neuronal drop-off and permanent weakness.

If you had your muscle strength evaluated and you know that a muscle group is grade 3+ or better, then you can do a graded exercise regimen. It is recommended that you feel completely recovered after 15 or 20 minutes of exercise and do not feel exhausted later that night or the next day, which would mean you have done too much. You need to be smart about what to do. Over time you will get a little bit weaker. If you try to do exercises you did 15 or 20 years ago, you can't. "There is a little bit of denial in there as well" he said.

There have been some studies that show that a person with adequate strength can increase his endurance with some activity. The guidelines are: some endurance activity for 30 minutes, 3 times a week, at 50-60% of your maximal heart rate. Strengthening exercise would be 5 or 10 repetitions per muscle group about three times a week. [The repetitions do not need to be done all at once] Again, it is recommended that you feel completely recovered after 15 or 20 minutes of

exercise and do not feel exhausted later that night or the next day. Those muscles should not be aching later that day or the following day, which would mean you had done too much. You need to be smart about what to do.

Some people tell Dr. Eberly that exercise has made their muscles stronger. He responds that the polio affected muscles are not getting any stronger but you are strengthening the muscles that are weakened from disuse.

There is a fine line between not doing anything and doing too much. A weak polio muscle that doesn't do anything is going to get weaker. You have to learn from your body and act accordingly.

After the age of 50, people lose about 1- 2% of their strength per year; people with post-polio syndrome seem to be on the higher end of this. Polio survivors who are not experiencing post-polio syndrome are on the lower end, the same as the general population.

Q. What is the effect of polio and aging on bone density and muscle strength?

Polio does not affect the bones directly, but it affects them indirectly. If you had polio and you develop muscle weakness that limits your function, then that can affect bone mineralization. Over time you get disuse osteopenia; it is not osteoporosis.

Osteopenia and Osteoporosis

Osteoporosis is decreased bone mineralization that is associated with the normal aging process. Osteopenia is a generalized term meaning decreased bone mineralization for whatever reason, but usually it is disuse. The extremity isn't being used normally and the bone atrophies. The saying, "If you don't use it you lose it", applies most to the bones in our body.

Bone responds to the demands that are placed on it. If you have a bone that gets a lot of stress it is going to get a lot of calcium deposition. It is going to get thickened and become hypertrophic because it needs to, so it can adapt to that stress. If you decrease the use that is put on that extremity, the calcium is going to be drawn out, because it does not need to be there. It is like a callous on your skin.

If you contracted polio when you were young, during those growing years, and had residual weakness that affected an extremity, it is not going to grow like the other extremities. Frequently, for people who had polio during those growing years, the extremity that was mostly affected will be shorter and smaller than the other

because most of the stress from walking has been put on the other side. That extremity has not seen the stresses of the muscle pull and ground reaction forces so it doesn't have that stimulus to grow and thicken and become a normal bone.

Calcium Replacement

Normal bone loss after the age of 30 is about 1% a year. Osteoporosis can develop; it doesn't matter if you have had polio or not. That is why it is important for people to take calcium throughout their life, especially women, because calcium regulation in the body is affected by many things, especially hormones. The hormonal function of estrogen in women plays a very important role in calcium absorption and deposition in the bones. Dr. Eberly recommends that all his women patients take calcium supplements, regardless of their age. How much calcium does he recommend? Take 500 mg. twice a day.

Then there is the whole issue of medications that are taken for osteoporosis, such as Fosamax, Actonel, and newer ones (Forteo) that are even stronger which require injecting and have a lot of side effects. The injectable drugs are given to patients who are so osteopenic they are getting spontaneous fractures in their spines, etc. These medications help with osteoporosis, but they will not really help with disuse osteopenia.

Q. If a person has an osteopenic hip will calcium supplements help that?

Generally speaking, the answer is no. If it is osteopenic from disuse (like someone in a wheelchair all the time) calcium supplements won't really help because the calcium intake to the bone is regulated based on need. Unless you are calcium deficient, supplements aren't really going to help because the bone is not being used. Being calcium deficient is rare; you would know it because of parathyroid and similar problems.

Bone Density Testing

When your primary care doctor orders a bone density scan, usually your spine and one hip are screened. Dr. Eberly advises that they check the good hip, not the one that was most affected by polio. He said, "I guarantee you that a polio hip is going to come out looking osteoporotic. That is not a reflection of your entire body. It is comparing a polio affected hip to a **'normal' hip** that has seen normal stresses placed on it throughout the years."

Muscle Strength and Aging

The normal population loses muscle strength at a rate of about 1- 2% a year after the age of 50, based on old data. People tend to be a little more active today so that data may be a little exaggerated at this time. With polio patients the decline is the same. Keep in mind that if you have post-polio syndrome, and you continue to exercise an affected muscle group to the point where it is aching all the time and having spasms and twitching (signs of overuse), you will accelerate the polio weakness, and that is not recoverable. That is why he tells patients to be smart about what they do in terms of exercise and activity.

Q. What are the guidelines for hip replacement surgery?

For hip replacement surgery you need a grade 3 muscle strength abductor muscle in your hip. The resting tone and contraction of hip abductor muscles pull the head into the socket. If those muscles are really weak (grade 3 minus or less), you run the risk of dislocating. “A chronically dislocating hip is far more debilitating than an arthritic hip - guaranteed”, he emphasized.

There is no muscle or tendon transfer for hip weakness. Remember that polio doesn't affect the muscles; it affects the nerves that go to the muscles. Polio is not a muscle problem, it is a nerve problem.

Q. When I overdo, what is the best way to treat my muscle pain, twitching, and spasms?

That is what happens when you overwork post-polio syndrome muscle groups: they ache, they will twitch, and you will have spasms. The best treatment for that is prevention.

Treatment and Preventing Overuse

You need to be smart about your activity level and you need to know your limitations. Remember, we are not saying don't do anything, just don't do too much. You have to learn from your body, and that is going to change over time. You may get a little weaker over time, so you can't do what you used to do. If there is something you must do, you may have to break it up into three parts.

Many people need to break up their day; they lie down for 15 or 20 minutes, two or three times a day. That helps especially with back pain. Post-polio syndrome frequently affects your spinal muscles and your antigavity muscles. So sitting

down doesn't help because you are using those muscles to sit upright. If you didn't use them you would flop over, so you have to lie down. Polio survivors need to get out of the chair and lie down to rest those muscles. When you get to this point where you've overdone it and you are having these problems, the treatment is rest. Taking an anti-inflammatory medication might help and you can use ice packs, but it is best if you don't overdo in the first place.

If you have been going along fine and are now beginning to have these muscle spasms and achiness, it may be a sign that you are getting weaker and no longer have the strength and endurance. Maybe you need a brace which would help substitute for that muscle weakness. If you already have a brace, maybe you need a different one. These are signs that perhaps it is time to be re-evaluated by a polio specialist to learn your current muscle strength, and what recommendations will be made for your condition.

Another important way to prevent overuse, especially with antigravity muscles and walking, is with a wheelchair or scooter. They are great, especially for long distances. Many patients, especially younger ones, are resistant to wheelchairs. They have to get to the point where it is a little too late and they have caused that damage and have gotten weaker because they have been overdoing it; then they will begin using a wheelchair or scooter (depending upon their weakness).

We look forward to another question and answer session with Dr. Eberly later this year. If you have a question to submit, please send it to:

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