

How to **Live a Long,** Active and Healthy Life

By Keeping Your
Musculoskeletal System Healthy



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How to Live a Long, Active and Healthy Life

By Keeping Your Musculoskeletal
System Healthy

A Pan-American Life Insurance Group Guide



Executive Summary

Everyone wants to live a long, active, and healthy life!

And yet, most people pay little attention to their **musculoskeletal system** — which is central to achieving this goal.

You probably remember from your high school biology course that the musculoskeletal system is made up of the bones, muscles, joints, tendons, ligaments, and cartilage in your body (Figure 1). This gives your body a structure that allows you to move, among many other important functions.

But did you know that a healthy musculoskeletal system can also protect you from life-threatening conditions such as cardiovascular disease¹ and diabetes^{2,3} as well as mental health issues like depression^{4,5}?

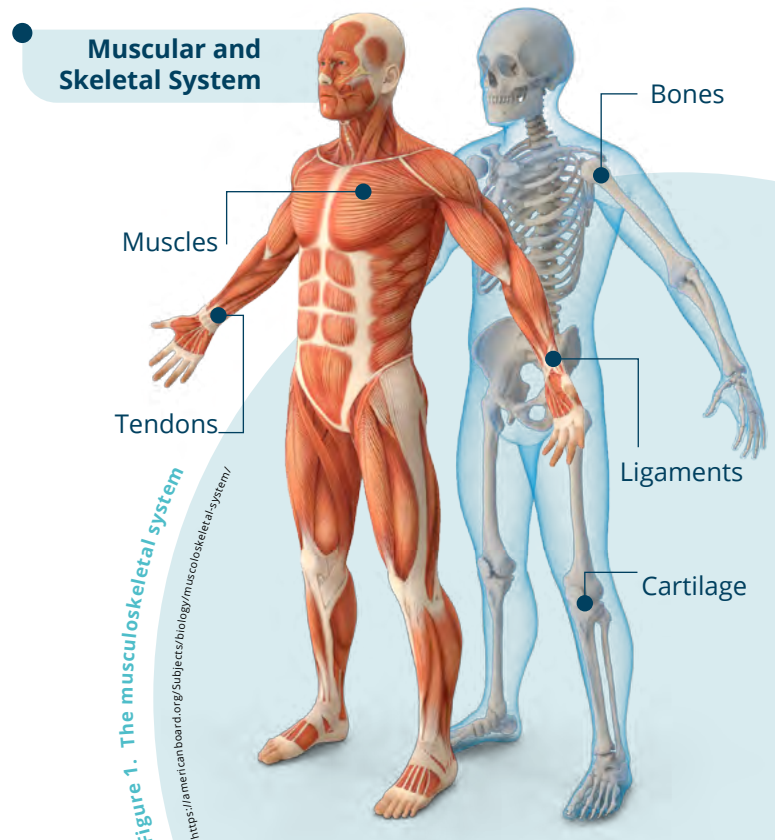
Most people don't give the health of

their bones, muscles, and joints a second thought. As result, musculoskeletal disorders and injuries including **low back pain**, **arthritis**, and **tendonitis** are some of the leading causes of disability in the world⁶.

But it doesn't have to be this way!

As we will present in the following pages, incorporating a few simple and practical daily habits in how you **move**, **eat**, and **rest** can make a in your ability to live an active, long, and pain-free life.

So, let's get started!





1 out of 5 people in the world has some form of chronic musculoskeletal pain, translating to **1.7 billion** people globally!

World Health Organization (WHO)⁶

3 keys

to keeping your Musculoskeletal System Healthy

STRONG & HEALTHY MUSCULOSKELETAL SYSTEM

Figure 2.



Building and maintaining a stronger and healthier musculoskeletal system is an achievable goal for most people.

In fact, you can make significant gains by focusing on just three key areas: (1) Movement; (2) Nutrition; and (3) Rest.

These three areas are so important that we refer to them as the foundational *“pillars”* of musculoskeletal health (Figure 2).

In the next few pages, we will detail specific actions you can take to improve in each of these three areas. For now, keep in mind the following:

1. MOVEMENT: The best thing you can do is to keep moving throughout the day. Whether you are at work or at home, not sitting for long stretches of time can make a huge difference. Making an effort to stay flexible and strengthen your muscles and bones is also important.

2. NUTRITION: What you eat is key! In addition to

maintaining a balanced diet, there are certain dietary habits that are particularly beneficial for building and maintaining injury-resistant bones and muscles. We will also look at the nutrients that are vital for a healthy body as well as the role of the digestive system.

3. REST: Finally, recent research has highlighted the importance of getting adequate sleep and rest for the regeneration of your core systems. We will examine what the latest science tells us about rest and sleep.

Throughout this guide, we will focus on the daily habits that are ***within your control*** and can ***have a significant impact*** on your musculoskeletal health.

Now, let's take a closer look at each of these key areas.

IMPORTANT



If you have been inactive and/or not exercising for a while, you should start slowly. Talk with your primary care physician or a trainer if you have any questions on how to get started or want to take your physical activity to the next level.

This information is provided for educational purposes only. Your primary care physician is your principal source of medical guidance.

MOVEMENT

Incorporating movement into your day is one of the most important things you can do to keep your musculoskeletal system healthy and strong!^{7,8}

Long, uninterrupted periods of sitting, whether in front of a work computer or at home watching television, are terrible for your musculoskeletal health (Figure 3). Sitting is associated with a higher risk of cardiovascular disease and cancer, among other chronic conditions^{9,10}.

Instead, you should aim to incorporate simple habits into your day that can help you improve in the following areas: motion, strength, flexibility, and balance (Figure 4).

MOTION: MOVE MORE - MOVEMENT BREAKS

Take short, regular *“movement breaks”* throughout the day, whether you are at work or at home.

Figure 3. How Excessive and Improper Sitting All Day Affects the Body



Source: NASA. DeskFit: 20 essential desk exercises you can do without leaving your office or home workspace



Figure 4.

Some people take a 5-minute break every 30 minutes, while others prefer a 2-minute break every 20 minutes. The timing and duration are not as important as making sure to take these regular *“movement breaks”* on a schedule that works for you, and that you can commit to actually sticking to on a regular basis.

During your movement break, you can walk around your office or home, stretch, or do a few push-ups. Again, what you do is less important than taking a break from sitting and getting active.

STRENGTH: BECOME STRONGER

The second key area of maintaining your musculoskeletal health through physical activity involves strengthening your muscles and bones through resistance and/or weight-bearing exercises¹¹.

There are many resistance training exercises that can be done pretty much anywhere, without specialized equipment (Figure 5)¹².

FLEXIBILITY – STAY NIMBLE

Your third movement goal is to maintain flexibility. As an expert at Harvard University Medical Center says, *“It’s not enough to build muscle and achieve aerobic fitness. You need to think about flexibility. Stretching can help.”*¹³.

Stretching is good for your entire body, especially the lower back. Figure 6 shows an example of a stretch recommended by the Mayo Clinic to keep your lower back flexible¹⁴. Other stretches are available through the link:<https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/back-pain/art-20546859>

BALANCE

Finally, your *balance* is important for preventing musculoskeletal injuries, especially falls.

Activities such as dancing and tai chi have been shown to improve balance, strengthen the core and musculoskeletal system, and lower the risk of falls¹⁵.

Some balance exercises you can do most anywhere are shown in Figure 7.

Resistance training has the same benefits as strength training without the gym.

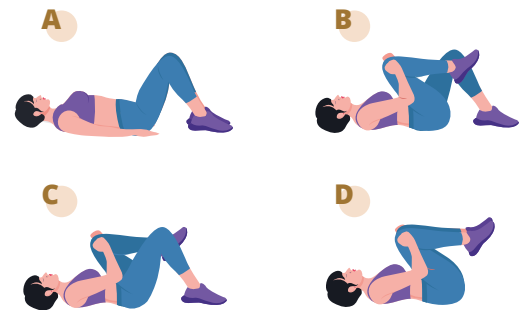


Figure 5. Exercises that Don't Require Any Specialized Equipment



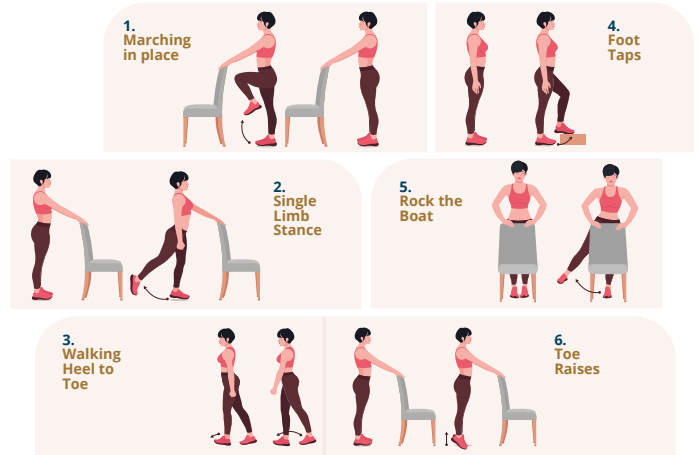
Source: D'Onofrio G et al. Musculoskeletal exercise: Its role in promoting health and longevity. Prog Cardiovasc Dis. 2023 Mar-Apr, 77:25-36

Figure 6. Flexibility Exercise example



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Figure 7. Balance Exercises You Can Do Anywhere



Source: <https://knollwoodnursingcenter.com/elderly-fall-prevention-exercises/>

NUTRITION

After physical activity, the second pillar to focus on in order to keep your musculoskeletal system healthy is to eat well. There are four aspects of your diet and nutrition to pay special attention to: (1) consuming a balanced diet rich in whole, fresh foods; (2) consuming enough lean protein for muscle maintenance and growth; (3) getting vitamin D and calcium for bone health; and (4) staying hydrated.

A BALANCED DIET

The cornerstone of good nutrition is a balanced diet consisting of high-quality foods in the right proportions. Harvard University's Healthy Eating Plate¹⁶ provides a great visual reminder of what foods you should eat and in what amounts (Figure 8).

The Healthy Eating Plate approach also advises consumers to avoid sugary beverages, a major source of calories in the American diet that usually provide little nutritional value.

Other language versions of Harvard's Healthy Eating Plate recommendations are available at <https://nutritionsource.hsph.harvard.edu/healthy-eating-plate/translations/>

PROTEIN

Protein is central to maintaining, building, and repairing muscles, and is therefore a critical nutritional building block for musculoskeletal health¹⁸. Protein also benefits immune function and hormonal health.

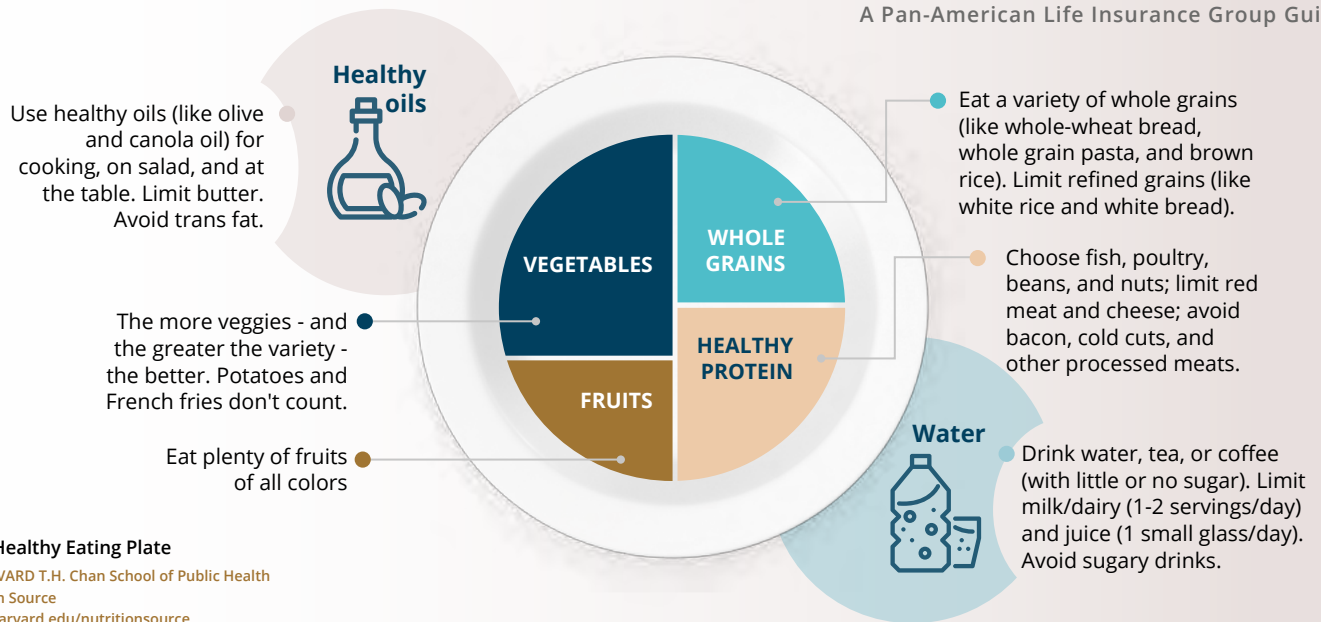


Figure 8. Healthy Eating Plate
Source: HARVARD T.H. Chan School of Public Health
The Nutrition Source
www.hsph.harvard.edu/nutritionsource

SO, HOW MUCH PROTEIN SHOULD YOU GET?

For people who are active and exercising, the recommended intake is between 1.2 to 1.7 grams of protein per kilogram of body weight per day. If you are middle-aged and moderately active, the lower end of this range is acceptable. If you are exercising strenuously and wanting to build muscle, aim for the upper end of this range. The range of protein you should consume based on your weight and some examples of how to get 25 grams of protein each day are shown in Figure 9¹⁷.

KEY NUTRIENTS FOR BONE HEALTH

Two other nutrients that are especially important for bone and musculoskeletal health are calcium and vitamin D.

Good sources of calcium include dairy products (e.g. milk, cheese, yogurt), almonds, broccoli, kale, canned salmon with bones, sardines, and soy products.

Good sources of vitamin D include oily fish, such as salmon, trout, whitefish, and tuna. Additionally, mushrooms, eggs, and fortified foods such as milk and cereals are good sources of nutrients. Sunlight also contributes to the body's production of vitamin D.

Figure 9.
Recommended Daily Protein Intake by Weight

YOUR WEIGHT	PROTEIN INTAKE (PER DAY)
100 pounds (45 kilograms)	54 to 77 grams
150 pounds (68 kilograms)	82 to 116 grams
200 pounds (91 kilograms)	109 to 155 grams
250 pounds (113 kilograms)	136 to 192 grams

Here's what
25 gr.
Protein
Looks Like

3oz. Chicken



1 Cup Greek Yogurt



8 Med. Shrimp



1 Cup Cottage Cheese



4 hardboiled eggs



1 Cup of Lentils



Source: <https://www.massgeneralbrigham.org/en/about/newsroom/articles/how-much-protein-when-working-out>



“If you aren’t eating enough protein, you’re going to experience things like physical fatigue, weakness, or pain in your joints or muscles because you’re not adequately supporting tissue growth.”¹⁷

Good sources of vitamin D include oily fish, such as salmon, trout, whitefish, and tuna. Additionally, mushrooms, eggs, and fortified foods such as milk and cereals are good sources of nutrients. Sunlight also contributes to the body's production of vitamin D.

STAY HYDRATED

Water is the main component of the body, representing approximately 76% of muscle mass,¹⁹ and is essential for a healthy musculoskeletal system and life.

Many factors impact how much water you need, including your age, sex, activity level, and overall health. In general, women need about 9 cups of fluid per day and men need about 13 cups in order to help replenish the amount of water that is lost²⁰.

A quick and easy way to check if you are getting enough water is to take a peek at the color of your urine. If you are sufficiently hydrated, your urine will be a pale-yellow color. If it is a dark yellow or amber color, you may need to drink more liquids.

REST

Figure 10. Tips to a Better Nighth Sleep



Better sleep habits can help you get a good night's sleep. Habits that can improve your sleep include:

- Going to bed and getting up at the same time every day.
- Keeping your bedroom quiet, relaxing, and at a cool temperature.
- Turning off electronic devices at least 30 minutes before bedtime.
- Avoiding large meals and alcohol before bedtime.
- Avoiding caffeine in the afternoon or evening.
- Exercising regularly and maintaining a healthy diet.

Source: CDC. <https://www.cdc.gov/sleep/about/index.html>

The third pillar of a healthy musculoskeletal system is adequate **rest**.

Recent research has found that inadequate sleep profoundly affects muscle health²¹ and other chronic conditions and can even increase the risk of death²². Even relatively short periods of sleep restriction can compromise glucose metabolism, reduce insulin sensitivity, and impair muscle function²³.

The U.S. Centers for Disease Control and Prevention (CDC) recommends that adults 18 years of age and older get between **7 and 9 hours of sleep per night**²⁴.

Sleep quality is just as important as the number of hours you sleep. This refers to getting uninterrupted and refreshing sleep. Signs of poor sleep quality include trouble falling asleep, repeatedly waking up during the night and feeling sleepy or tired even after getting enough sleep. Some tips for getting a better night's sleep are listed in Figure 10.




You now have a better understanding of how to keep your musculoskeletal system strong and healthy through simple daily habits focused on movement, nutrition, and rest. In the next section of this guide, we will look at some of the most common disorders and injuries that affect this delicate organ system.

Musculoskeletal Conditions and Injuries

Musculoskeletal conditions are typically characterized by persistent pain and limitations in mobility and dexterity, reducing people’s ability to work and fully enjoy their lives. Musculoskeletal pain is one of the most common forms of pain.

The three most common musculoskeletal conditions are lower back pain, osteoarthritis, and neck pain^{25,26 27}.

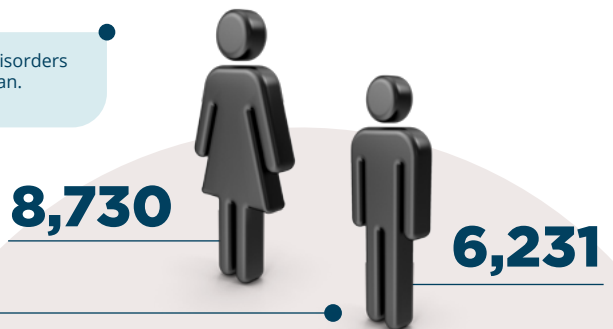
Table 1. Three Most Common Musculoskeletal Conditions in the World

Rank	Disorder/Injury	Description	Common Symptoms	Risk Factors	
1	Lower Back Pain	Pain in the lower back, can be acute or chronic	Dull ache to sharp pain, reduced mobility	Poor posture, heavy lifting, obesity	
2	Osteoarthritis	Degeneration of joint cartilage and underlying bone	Joint pain, stiffness, swelling	Age, obesity, joint injuries, genetics	
3	Neck Pain	Pain in the neck, can be acute or chronic	Dull ache to sharp pain, reduced mobility	Poor workplace (screen) set-up, inactivity	

The prevalence of musculoskeletal disorders tends to be higher in women than in men²⁹ (Figure 11). The causes for these differences are complex and vary by condition but are thought to involve biological (genetic and hormonal) as well as social and psychological differences between the sexes³⁰. Over 40% of women report low back pain during pregnancy³¹.

Figure 11. The prevalence rate of musculoskeletal disorders in women vs. men in Latin America and the Caribbean. Rate per 100,000 inhabitants.

Rate is
40% Greater
among Women



Source: Mendoza-Pinto C et al. Burden of Other Musculoskeletal Disorders in Latin America and the Caribbean: Findings of Global Burden of Disease Study 2019. JRC: Journal of Clinical Rheumatology 30(1);p 1-7, January 2024





 Childhood & Adolescence	 Young Adulthood (20s-30s)	 Middle Age (40s-50s)	 Older Adulthood (60+)
<p>Sports Injuries: Young athletes may experience acute injuries or overuse syndromes.</p> <p>Growth-Related Disorders: Conditions like Osgood-Schlatter disease and scoliosis often occur during periods of rapid growth.</p>	<p>Obesity and Sedentary Lifestyle: Increased weight and decreased physical activity can contribute to joint and back pain.</p> <p>Work-Related Injuries: Young adults entering the workforce may experience MSDs due to improper ergonomics or manual labor.</p> <p>Recreational Activities: High participation in physical activities and sports can lead to injuries.</p>	<p>Degenerative Changes: Conditions such as osteoarthritis and degenerative disc disease begin to manifest as cartilage and discs start to wear down.</p> <p>Chronic Overuse: Cumulative effects of repetitive strain and poor ergonomics can result in tendinitis, bursitis, and carpal tunnel syndrome.</p> <p>On-Going Obesity and Sedentary Lifestyle: Increased weight and decreased physical activity can contribute to joint and back pain.</p>	<p>Osteoporosis: The risk of osteoporosis and related fractures increases with age, especially in postmenopausal women.</p> <p>Severe Osteoarthritis: Advanced osteoarthritis becomes more common, leading to significant pain and reduced mobility.</p> <p>Spinal Stenosis: Degenerative changes in the spine can lead to conditions like spinal stenosis, causing pain and nerve compression.</p>

Figure 12. Some Causes of Musculoskeletal Conditions through the Life Span

The causes of musculoskeletal conditions also change as you age (Figure 12).

During childhood and adolescence, most musculoskeletal injuries are due to sports, while growth disorders are fairly rare.

During young adulthood (20s-30s), musculoskeletal conditions are mostly caused by work-related injuries, including sedentary computer work, and by the onset of inactivity and obesity.

The peak prevalence of musculoskeletal disorders is between the ages of around 40-60 years old, when many people have gained extra weight and are less active than in their younger days. Certain degenerative changes (e.g. osteoporosis) begin to emerge around this time, and chronic overuse of the musculoskeletal system, often associated with one's job, will also take its toll over many years or decades.



Low back pain is the single leading cause of disability worldwide. In Latin America and the Caribbean, nearly 8% of population is suffering from some form of back pain ^{28,25}

PAIN

More Than Just a Physical Sensation

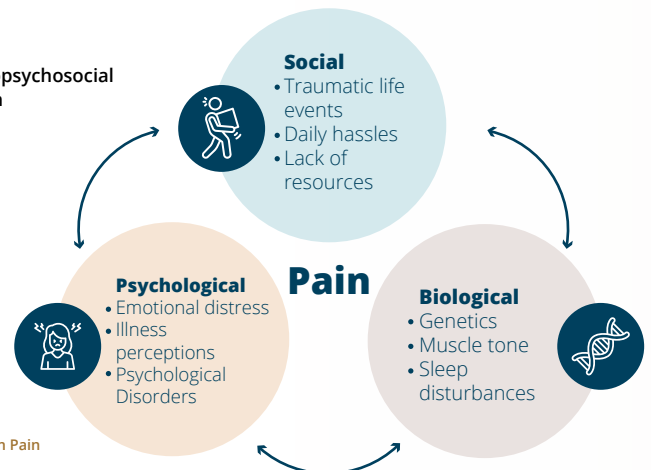
Pain is a common symptom of most musculoskeletal conditions and disorders. But the sensation of pain is influenced by more than just biological, or physical, phenomena. Medical experts now recognize pain as “a personal experience that emerges from a dynamic interplay between biological, psychological, and social factors (Figure 13)”.³²

The World Health Organization has recently recognized the biopsychosocial nature of pain in the 11th revision of the International Classification of Diseases (ICD-11)³³.

On an individual level, if you or a loved one are experiencing pain, it can be helpful to know that it may be influenced by a variety of social, psychological, and biological factors.

We encourage you to share any social and psychological situations that may be contributing to your pain with your primary care physician. Doing so may help your doctor develop a more individualized and effective treatment and recovery plan.

Figure 13. Biopsychosocial Model of Pain



Source: European Pain Federation

When to See a Doctor



In spite of your best efforts, there may be times when you are suffering from a musculoskeletal injury, pain, or other symptoms. This Guide is NOT intended to replace your physician's recommendation. We have included some general guidelines for when you should urgently see a doctor if you have lower back pain, as an example.

When to See a Doctor for Back Pain, according to the Mayo Clinic

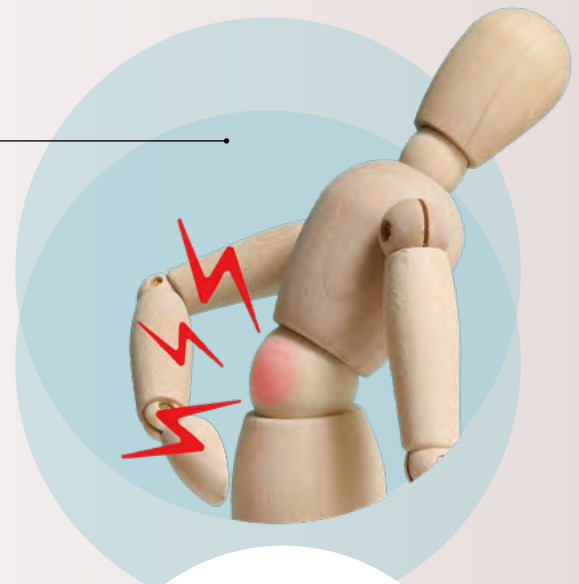
Most back pain gets better within a few weeks without treatment. Bed rest is not recommended. Over-the-counter pain medications and applying cold or heat to the area can often help reduce back pain.

Schedule an office visit. Call your healthcare provider if your back pain hasn't improved after a week of home treatment or if your back pain:

- Is constant or intense, especially at night or when lying down
- Spreads down one or both legs, especially if the pain extends below the knee
- Causes weakness, numbness or tingling in one or both legs
- Occurs with unintended weight loss
- Occurs with swelling or redness on the back

Seek emergency medical care or have someone drive you to the emergency room if your back pain:

- Occurs after a trauma, such as a car crash, bad fall or sports injury
- Causes new bowel or bladder control problems
- Occurs with a fever



NOTE:

This information is provided for educational purposes only. Your primary care physician is your principal source of medical guidance.

PALIG'S

Resources and Programs

PALIG offers a significant number of resources and programs to help you care for your bones, muscles, and joints, as well as dedicated specialized programs for lower back pain and other conditions.

A large selection of free, Spanish- and English-language articles and videos are available at the PALIGMED.com Health Resource Library. Some examples include:

PALIG Health Hub

[Leave Your Back Pain Behind](#)

[How to Get Rid of Neck Pain - And Prevent it From Returning](#)

[Strengthening Videos](#)

The PALIG Personal Health Guide Series

This is the third in PALIG Personal Health Guide Series. The first two free guides are available through the links below:



Your Personal Health Roadmap

[Click to White Paper](#)



Breast Cancer Early Detection

[Click to White Paper](#)



PALIG Programs for Musculoskeletal Health and Disorders

PALIG is dedicated to doing everything we can to help you prevent and manage your musculoskeletal condition.

One of our flagship care management programs is called Back School Program. This cutting-edge program, available exclusively to PALIG's policy holders, has been running for many years with great success.

WHAT IS PALIG'S BACK SCHOOL PROGRAM™?

The Back School Program is a Pan-American program coordinated with your insurance broker/agent that includes guidance and personalized treatment for problems of the spine that also involve the neck and back.

IS THE PROGRAM SUCCESSFUL?

Yes! Many PALIG members who were initially scheduled for back surgery and chose to participate in the "Escuela de la Espalda" program first have reported significant improvement in their conditions. In several cases, members no longer required surgery after completing the program. Additionally, participant satisfaction with the program is very high.

WHO CAN APPLY TO THE BACK SCHOOL PROGRAM?

People with spinal injuries who have been evaluated by a specialist neurosurgeon or orthopedist and whose evaluation has indicated the need or possibility for spinal surgery may be eligible for the program.

BENEFITS OF THE PROGRAM

- Rapid enrollment and personalized treatment
- Education and guidance about caring for and the health of the spine
- Strengthening therapies and rehabilitation before or after spinal surgery

Direct Pay: The insured will not need to pay the clinic for services that are part of the program

PALIG's Back School Program Member Testimonial

"Due to my severe back pain, my doctor asked for medical tests and subsequently diagnosed me with Lumbar Discopathy, which really worried me. I was referred to (PALIG's) Back School Program and received 10 therapy sessions in conjunction with rehabilitation. They taught me exercises to stretch and help me stay pain-free, and above all, they helped me prevent the condition from progressing. I received very good care, my recovery was excellent, and most importantly, the pain decreased. I had a great experience, and I highly recommend the program."

PALIG Member





Conclusion

We hope this latest Personal Health Guide on keeping your musculoskeletal system healthy and strong has been helpful. We encourage you to take advantage of the many other resources and programs that PALIG has to offer, and to reach out to us with any questions or feedback you might have.



For more information about PALIG's health programs, we encourage you to contact us at myhealth@palig.com

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