Locomotive Syndrome

Walk on your own two feet for life.

The Locomotive Challenge!

Japanese Orthopaedic Association

Packed with info on preventing locomotive syndrome!

The Locomotive Challenge! website

Want to know more about locomotive syndrome?
Visit the Locomotive Challenge website!

Locomotive Syndrome Advisors

Locomotive syndrome advisors are orthopedic specialists able to offer professional advice on the condition. Find your nearest locomotive syndrome advisor on the Locomotive Challenge! website.

Locomotive syndrome Q&A

Anything you want to know about locomotive syndrome? A Locomotive Syndrome Advisor will answer all your questions.

Visit www.locomo-joa.jp! Locomotive Challenge Search

About the Locomotive Challenge!

Beating locomotive syndrome is one of the challenges facing Japan today.
The Japanese Orthopaedic Association believes that locomotive syndrome is a challenge that needs to be tackled by the whole of society, with healthcare providers, the private sector, and government all joining forces. So we' ve launched the Locomotive Challenge! Council to educate the public about locomotive syndrome and build a society resilient to it.

The inspiration behind the Locomotive Challenge!
Japan has the oldest population in the world, and we consider educating the public about locomotive syndrome prevention to be one of the big challenges facing Japanese society today. So we' ve made our slogan the "Locomotive Challenge!".

The Locomotive Challenge!

Name of organization:	The Locomotive Challenge! Council
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Associate Members:	Eisai Co., Ltd.; Japan External Preparations Council; Kao Corporation; Megmilk Snow Brand Co., Ltd. ; Mikasa Seiyaku Co., Ltd.; Teijin Pharma Ltd.; Zimmer Biomet G.K. (in alphabetical order; as of April 1, 2016)

Some of the Council's activities

Public lectures

Fun exercise demos

Friendly consultations

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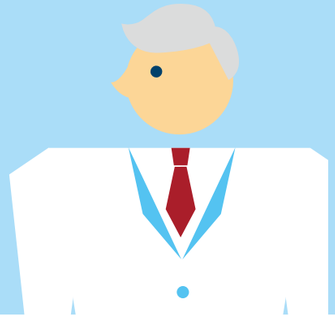
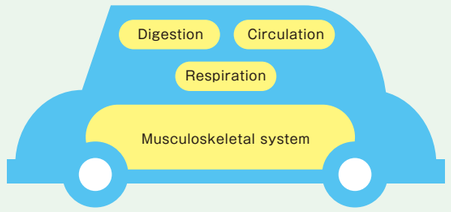
Ever heard of the “musculoskeletal system” — the system that gives your body the ability to move?



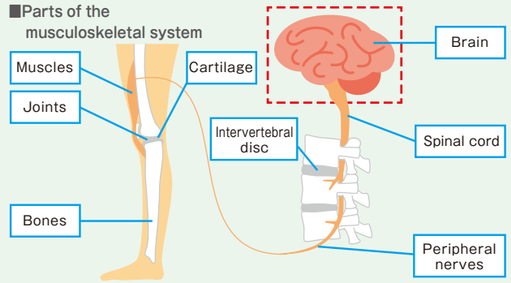
The musculoskeletal system

The human body has different systems specializing in different functions. You’re probably familiar with the respiratory system (consisting of the trachea and lungs), which takes in oxygen and expels carbon dioxide; the circulatory system (consisting of the heart and blood vessels), through which blood flows carrying oxygen, nutrition, and waste; and the digestive system (consisting of the stomach and intestines), which digests and absorbs food. Well, what gives your body the ability to move is the musculoskeletal system, consisting of your bones, joints, muscles, and nerves. The bones, joints, and muscles all work together in sync, and when any one of them is out of order, it diminishes your body’s ability to move.

■The musculoskeletal system is like the engine and tires of a car. Your body can’t move properly if any part of the system is broken.



■Parts of the musculoskeletal system

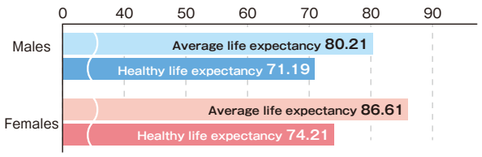


Maximize your healthy life expectancy, and walk on your own two feet for life.

Are you familiar with the term “healthy life expectancy”? Healthy life expectancy means the number of years you can expect to live in good health. In Japan, the difference between average life expectancy and healthy life expectancy is about nine years for men and twelve years for women. Everyone wants to lead a healthy, active life until the end. So maximize your healthy life expectancy!

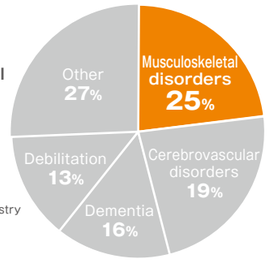
The greatest threat to healthy life expectancy is losing your independence or becoming bedridden, so that you require special assistance or nursing care. Do you know what the number one reason for that is? Disorders of the musculoskeletal system. If you end up requiring assistance or becoming confined to bed, you’re not the only one affected; so too are your family and others close to you. So you owe it not just to yourself but also to friends and loved ones to keep your musculoskeletal system in good working order.

■Difference between average life expectancy and healthy life expectancy in Japan



SOURCES: For average life expectancy (2013), Japanese Ministry of Health, Labour and Welfare, Complete Life Tables 2013; for healthy life expectancy (2013), Study on Future Projections of Healthy Life Expectancy and the Cost-Effectiveness of Measures against Lifestyle Diseases (Health Labour Sciences Research Grant-funded project).

■Reasons for requiring special assistance or nursing care



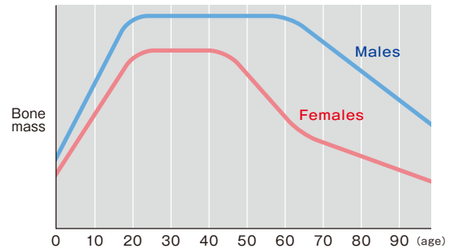
SOURCE: Japanese Ministry of Health, Labour and Welfare, Comprehensive Survey of Living Conditions 2013.

Don’t think you’re too young to worry. Get into the exercise habit while you’re still youthful!

Did you realize that your bone and muscle mass peak in your twenties and thirties? Conditioning your bones and muscles through moderate exercise, along with getting proper nutrition, is the way to keep them strong and healthy. If you let them grow weak, by your forties and fifties you’ll start feeling your physical powers decline, and after hitting your sixties you may find your body no longer moves the way you want it to.

Cartilage and the discs of your spine, like muscles and bones, also need proper exercise. But placing excessive strain on them by overdoing sports or being overweight actually damages them. Conversely, being too thin weakens the muscles and bones. So it’s not good to be either overweight or underweight. Does either description apply to you?

■Change in bone mass with age



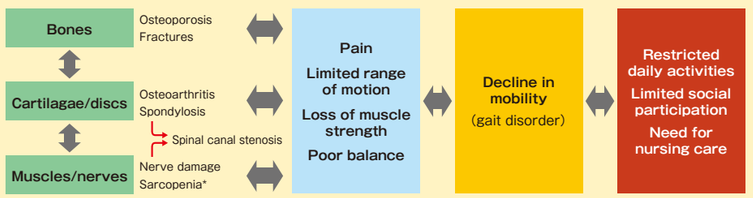
■Being either underweight or overweight creates problems.

Requiring nursing care, or being at risk of doing so, due to a decline in mobility resulting from a disorder of the musculoskeletal system is termed

LOCOMOTIVE SYNDROME.

Locomotive syndrome means being restricted in one’s ability to walk or lead a normal life owing to a dysfunction in one or more of the parts of the musculoskeletal system — muscles, bones, joints, cartilage, or the intervertebral discs. Japan faces a future as the most elderly society humankind has ever known, and with that prospect in mind the Japanese Orthopaedic Association proposed the concept of locomotive syndrome in 2007. Today all of us need to take steps to prevent locomotive syndrome and extend our healthy life expectancy, so we can all walk on our own two feet for life.

■Locomotive syndrome: A conceptual diagram



*Loss of muscle mass and strength as part of the aging process.

Turn the page for more information on locomotive syndrome and how to prevent it!

Here are the causes and symptoms of locomotive syndrome. Do any apply to you?

Mobility defined:
The ability to stand, walk, run, sit, climb the stairs, and perform other physical functions essential to daily life.

People lose their mobility imperceptibly by stages, from being in good health to becoming dependent on nursing care. Maybe your mobility is gradually declining but you're pretending not to notice the signs.

Lack of regular exercise
If you fail to get regular exercise, your musculoskeletal system will slowly atrophy.

Being under- or overweight
If you're underweight, the bones and muscles that support your body will steadily lose strength. Being overweight puts tremendous stress on the hip and knee joints. Once the cartilage of the joints becomes worn down, the tissue can't easily be restored.

● Healthy

Unheeded pain and listlessness
If you have a sore back or your knees hurt, maybe you just ignore it because you think it's part of the aging process. Well, your musculoskeletal system could be deteriorating without your knowing it. Such aches may even be indicative of a serious illness lurking.

● Musculoskeletal damage

Reduced physical activity
Constantly taking the elevator and driving everywhere are among the habits that reduce physical activity, so beware! Walk on your own two feet.

Overdoing sports and injuring yourself
The joints are extremely delicate, so if when playing sports you're too hard on them or fail to follow the proper form, you could suddenly injure yourself and do some serious damage.

● Back and knee pain

● Musculoskeletal disease worsens as signs go unheeded

Onset of musculoskeletal disease

■Osteoporosis
People with osteoporosis have brittle bones and are susceptible to fractures. They can break a bone with even a minor fall and may suffer compression fractures of the spine without even realizing it.
If your back is hunched or you've lost height, osteoporosis may be suspected.

■Osteoarthritis
Osteoarthritis causes pain and limits range of motion (the ability to flex and extend the joints) due to abrasion of the articular cartilage. It's particularly common in the joints of the knees and hips. That's why it's important to move your joints and tone the muscles surrounding them.

■Spondylosis
This disease occurs when pressure on the spine wears down the intervertebral discs and deforms the bone, causing serious pain.
If the nerves become pinched, a condition called spinal canal stenosis results, causing pain and tingling in the legs.

Can't be bothered to go out?
When people have difficulties getting around, it can be bothersome or even impossible to go out. Do you avoid meeting friends or going out with family and spend the whole day at home?

● Heightened risk of becoming care-dependent

● Dependent on nursing care

Full-blown locomotive syndrome

People's mobility varies greatly depending on their daily lifestyle and whether or not they take appropriate action. Regardless of age, if any of the above signs and symptoms apply to you, it's important to take the right steps, whether modifying your lifestyle, getting into the habit of regular exercise, or seeing a medical professional for a checkup.

Do any apply to you? Seven warning signs of locomotive syndrome

1 ☐ You can't put your sock on standing on one leg.

2 ☐ You often trip up or slip around the house.

3 ☐ You need to hold on to the handrail when climbing the stairs.

4 ☐ You have difficulty doing moderately heavy housework.

5 ☐ You have difficulty carrying home 2 kg of shopping.
*Equivalent to 2 1-liter cartons of milk.

6 ☐ You can't walk for a quarter of an hour nonstop.

7 ☐ You can't make it across the road before the light turns red.

Could you already have locomotive syndrome? Turn the page for a detailed self-assessment.

Assess your locomotive functions!

Try the locomotive syndrome risk test

1 The stand-up test

This test assesses leg strength by having you stand up on one or both legs from a specified height.

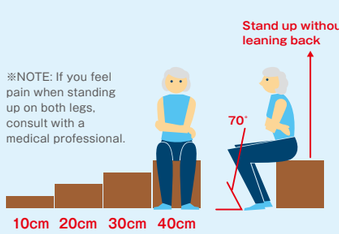
How to conduct the stand-up test

Prepare four seats of different heights — 40 cm, 30 cm, 20 cm, and 10 cm.
Starting at 40 cm, stand up from each, first with both legs, then with one leg.

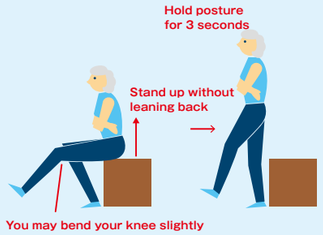
1 Prepare four seats of different heights — 40 cm, 30 cm, 20 cm, and 10 cm. First sit on the 40 cm seat, arms folded. Spread your legs to the width of your shoulders, with your shins at an angle of 70 degrees to the floor. (in the case of the 40cm seat).Then stand up, without leaning back to gain momentum, and maintain posture for three seconds.

2 If you can stand up from a height of 40 cm on both legs, next try it on one leg. Resume the posture of Step 1, and raise either your right or left leg, bending the knee slightly. Stand up without leaning back to gain momentum, and maintain posture for three seconds.

On both legs



On one leg



3 If in Step 2 you're **able** to stand up on one leg…
If you can stand up on both your right and left leg, you've **passed**. Next try the same thing from lower heights at 10 cm decrements.

If in Step 2 you're **unable** to stand up on one leg…
If you can't stand up on both your right leg and your left leg, you've **failed**. Now try standing up on both legs from lower heights at 10 cm decrements.

Determining your result

<Able to stand up from 40 cm on one leg?⇒Try on one leg from a lower height>

Try on one leg and then the other at 10 cm decrements.
The lowest height from which you can stand both on your right leg and on your left leg is your test result.

<Unable to stand up from 40 cm on one leg?⇒Try it with both legs>

Try the stand-up test with both legs at 10 cm decrements.
The lowest height from which you can stand on both legs is your test result.

[Relative difficulty of standing from each height]
40cm, both legs<30cm, both legs<20cm, both legs<10cm, both legs<40cm, one leg<30cm, one leg <20cm, one leg <10cm, one leg

Caveats

- Be careful not to strain or injure yourself.
- If your knees start to hurt, stop the test.
- Don't lean back to gain momentum: you could topple backwards.

SOURCE: Shingo Muranaga, Journal of the Showa Medical Association (2001) 61(3):362-367.

About the locomotive syndrome risk test

The locomotive syndrome risk test consists of three parts.

1 **The stand-up test** for assessing leg strength
2 **The two-step test** for measuring length of stride
3 **A 25-question risk assessment** on your physical condition and lifestyle

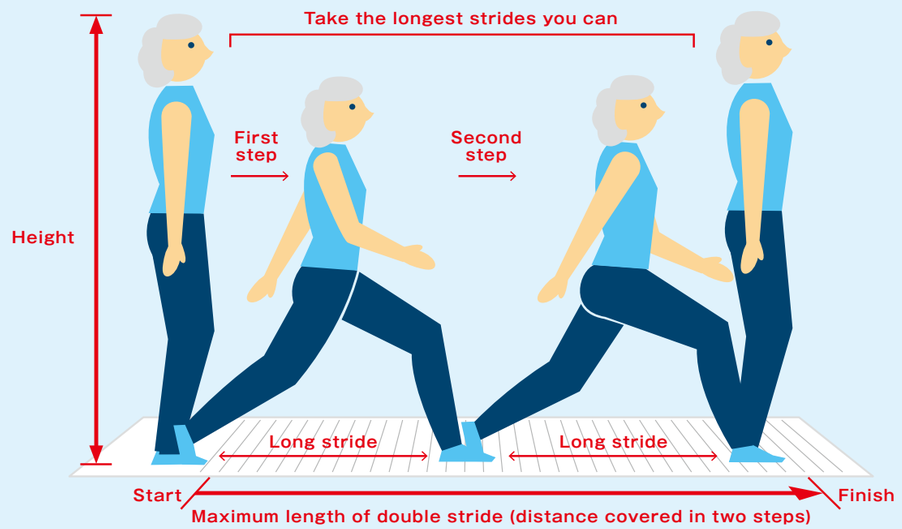
2 The two-step test

This test measures length of stride. It also lets you perform a general assessment of walking ability, including muscular strength, balance, and flexibility of the lower limbs.

How to conduct the two-step test

1 Decide your starting line and stand with the toes of both feet behind it.
2 Take two long strides — the longest you can — then align both feet.
(If you lose your balance, the attempt is a failure.)
3 Measure the length of the two strides
(from the starting line to the position of the tips of your toes where you stopped).
4 Do the test twice and record the better result.
5 Calculate your two-step score using the following formula.

■Formula for calculating your two-step score
Length of both strides in cm ÷ your height in cm = your two-step score



Caveats

- Do the test on a non-slippery surface.
- Wear shoes if possible.
- Do warm-up exercises first.
- Only go as far as you can without losing your balance.
- No jumping.

SOURCE: Shingo Muranaga et al., Journal of the Showa Medical Association (2003) 63(3):301-308.

Try the locomotive syndrome risk test

3 25-question risk assessment

Over the past month, have you experienced any pain or had difficulties with activities of daily living?
Please answer the following 25 questions to help determine your risk of locomotive syndrome

■Following are questions about your body pain for the last one month:						
Q1	Did you have any pain (including numbness) in your neck or upper limbs(shoulders, arms, or hand)?	No pain	Mild pain	Moderate pain	Considerable pain	Severe pain
Q2	Did you have any pain in your back, lower back or buttocks?	No pain	Mild pain	Moderate pain	Considerable pain	Severe pain
Q3	Did you have any pain (including numbness) in your lower limbs (hip, thigh, knee, calf, shin, ankle, or foot)?	No pain	Mild pain	Moderate pain	Considerable pain	Severe pain
Q4	To what extent has it been painful to move your body in daily life?	No pain	Mild pain	Moderate pain	Considerable pain	Severe pain
■Following are questions about your usual daily life for the last one month:						
Q5	To what extent has it been difficult to get up from a bed or lie down?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q6	To what extent has it been difficult to stand up from a chair?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q7	To what extent has it been difficult to walk inside the house?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q8	To what extent has it been difficult to put on and take off shirts?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q9	To what extent has it been difficult to put on and take off trousers and pants?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q10	To what extent has it been difficult to use the toilet?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q11	To what extent has it been difficult to wash your body in the bath?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q12	To what extent has it been difficult to go up and down stairs?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q13	To what extent has it been difficult to walk briskly?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q14	To what extent has it been difficult to keep yourself neat?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q15	How far can you keep walking without rest? (please select the closest answer)	Mor than 2-3 km	approximately 1 km	approximately 300 m	approximately 100 m	approximately 10 m
Q16	To what extent has it been difficult to go out to visit neighbors?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q17	To what extent has it been difficult to carry objects weighing approximately 2 kilograms (2 standard milk bottles or 2 PET bottles each containing 1 liter)?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q18	To what extent has it been difficult to go out using public transportation?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q19	To what extent have simple tasks and housework (preparing meals, cleaning up, etc.) been difficult?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q20	To what extent have load-bearing tasks and housework (cleaning the yard, carrying heavy bedding, etc.) been difficult?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q21	To what extent has it been difficult to perform sports activity (jogging, swimming, gate ball, dancing, etc.)?	Not difficult	Mildly difficult	Moderately difficult	Considerably difficult	Extremely difficult
Q22	Have you been restricted from meeting your friends?	Not restricted	Slightly restricted	Restricted about half the time	Considerably restricted	Gave up all activities
Q23	Have you been restricted from joining social activities (meeting friends, playing sport, engaging in activities and hobbies, etc.)?	Not restricted	Slightly restricted	Restricted about half the time	Considerably restricted	Gave up all activities
Q24	Have you ever felt anxious about falls in your house?	Have not felt anxious	Have occasionally felt anxious	Have sometimes felt anxious	Have often felt anxious	Have constantly felt anxious
Q25	Have you ever felt anxious about being unable to walk in the future?	Have not felt anxious	Have occasionally felt anxious	Have sometimes felt anxious	Have often felt anxious	Have constantly felt anxious
Enter the number of answers →		0 points =	1 point =	2 point =	3 point =	4 point =
Add up the number of points →		Total			points	

If you already have pain or discomfort, consult with your local orthopedist.

For professional advice on locomotive syndrome, ask your nearest

Locomotive Syndrome Advisor.

If you already suffer from pain or discomfort in your back or legs, don't try to diagnose the problem on your own; consult with your local orthopedist. Locomotive syndrome advisors are orthopedic specialists able to offer professional advice on the condition. Find your nearest locomotive syndrome advisor on the Locomotive Challenge! website.

Visit www.locomo-joa.jp!

Locomotive Challenge Search

Determine your risk of locomotive syndrome

Use your test results to determine if you're at a risk level of 1 or 2!

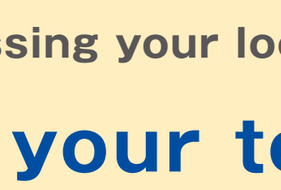
How to determine your risk level

Determine your locomotive syndrome risk level from the present state of your locomotive functions as revealed by your results on the stand-up test, the two-step test, and the 25-question risk assessment.

Regardless of your age, your risk level is deemed to be 1 or 2 if you meet even one of the relevant criteria.

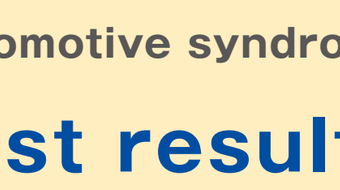
Determining your level

Risk level 1



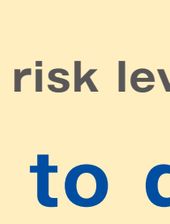
1

Can't stand up from a height of 40 cm on one leg or the other



2

Your two-step score is less than 1.3



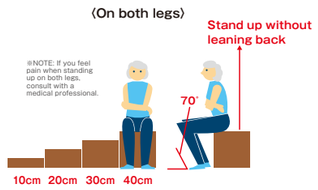
3

You got 7 points or more on the 25 questions

If you meet even one of these criteria, your risk level is 1!

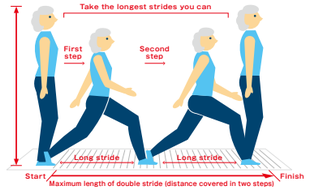
A locomotive syndrome risk level of 1 indicates that the decline of your locomotive functions has already begun. Your muscular strength and balance are deteriorating, so you need to get into the habit of performing regular exercise such as locomotion training. Also take care to eat a balanced diet with plenty of protein and calcium.

Risk level 2



1

Can't stand up from a height of 20 cm on both legs



2

Your two-step score is less than 1.1

3

You got 16 points or more on the 25 questions

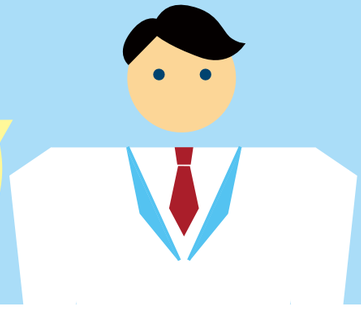
If you meet even one of these criteria, your risk level is 2!

A locomotive syndrome risk level of 2 indicates that the decline of your locomotive functions is already advanced. You're at high risk of becoming unable to lead an independent lifestyle. You may have a locomotive organ disorder, so it's recommended you see an orthopaedist.

Turn the page for actual ways to prevent locomotive syndrome!

Monitor the state of your locomotive functions by doing the locomotive syndrome risk test regularly.

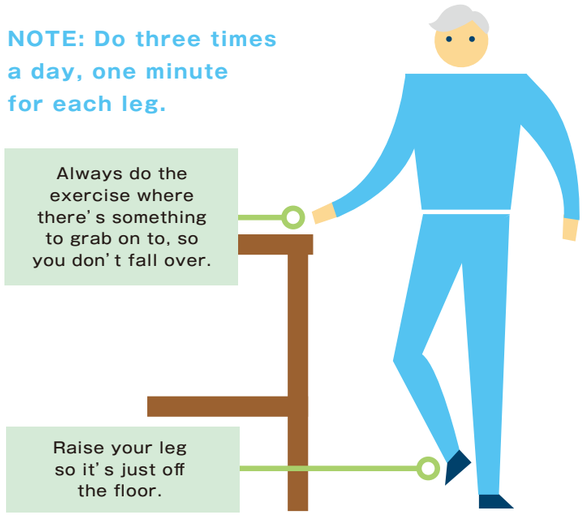
Keep your back and legs fit for life with locomotion training. The important thing is to make it a habit.



Locomotion training consists of just two exercises. Do them every day!

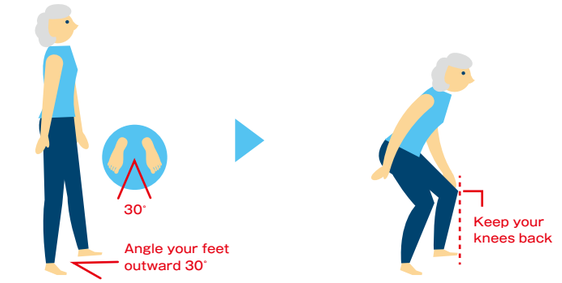
One-leg stands for improving your balance

NOTE: Do three times a day, one minute for each leg.



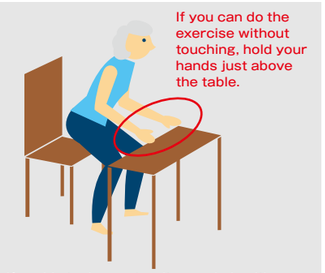
- Keep your back straight during the exercise.
- If you require something to lean on, carefully place your hands or fingers on a table. You can use either one or both hands.

Squats for strengthening your leg muscles.



1 Stand with your legs slightly further apart than the width of your shoulders. Angle your feet outward 30 degrees.

2 Lower your body while pushing your buttocks back. Ensure your knees don't extend beyond the tips of your toes, and keep them pointed in the direction of your second toe.



If unable to do squats, sit on a chair with your hands on the table and repeatedly stand up and sit down.

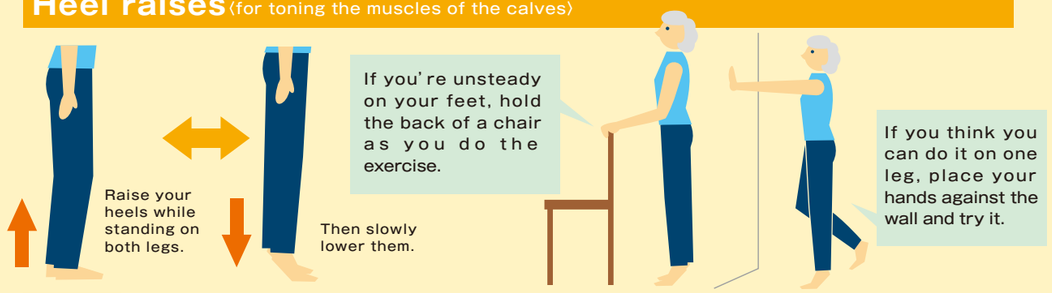
NOTE: Repeat 5-6 times in sync with deep breathing. Do three times a day.

TIPS

- Don't hold your breath while doing the squat.
- In order not to put excessive strain on your knees, avoid bending them more than 90 degrees.
- Perform the exercise slowly, conscious of your front and rear thigh muscles tensing.
- If you require something to lean on, carefully place your hands or fingers on a table.

Exercises to add to your locomotion training program. Try them to the extent you're able!

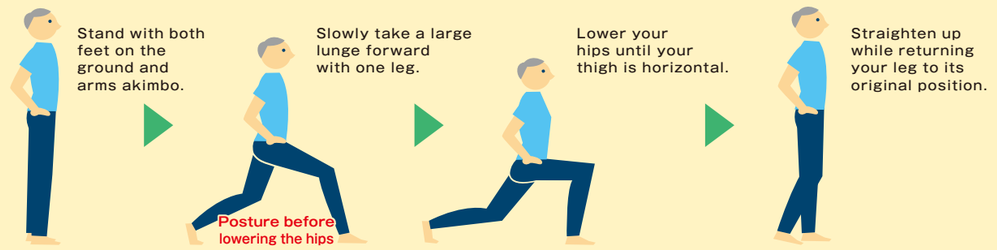
Heel raises ⟨for toning the muscles of the calves⟩



TIP If you feel like you're going to lose your balance, place your hands on the wall or table. And beware of raising your heels too high: you could easily fall over.

Daily quota: 10-20 times (as many as you can) × 2-3 sets

Front lunges ⟨for improving flexibility, balance, and muscular strength of the lower limbs⟩



TIP Keep the upper body straight with your chest thrust out. Be careful not to lunge forward so far you lose your balance.

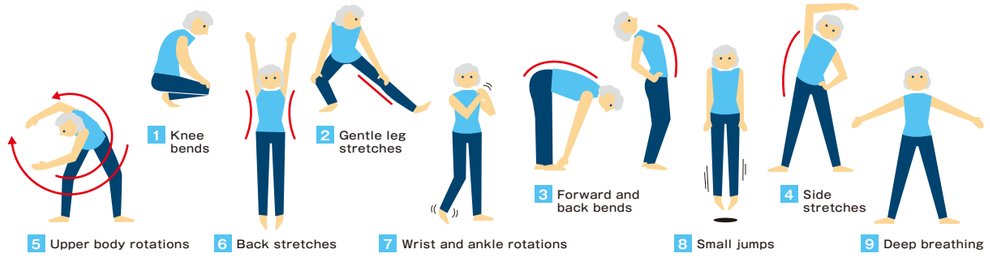
Daily quota: 5-10 times (as many as you can) × 2-3 sets

Making exercise part of your routine

Take steps to improve flexibility and move your body more!

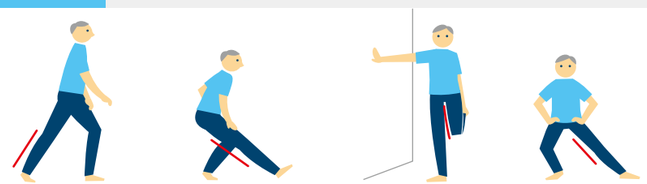
Calisthenics and stretching. Also suitable for warming up and warming down before and after exercise.

Light exercises — For relaxing muscles and joints with large, leisurely movements.

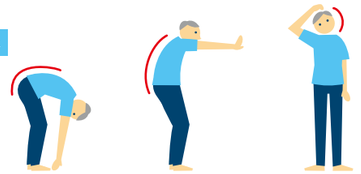


Stretching — For relaxing muscles and joints with 20 seconds of light stretching.

Legs



Trunk



Shoulders and arms

TIPS

- Don't hold your breath.
- Stretch slowly for 20-30 seconds.
- Do these exercises in moderation; they shouldn't hurt.
- Be conscious of your muscles stretching as you do each exercise.
- Don't swing to gain momentum or push down on the part being exercised.

SOURCE: Ministry of Health, Labour and Welfare, Exercise Guide 2006.

Add an extra 10 minutes to your daily routine!

Just 10 minutes!

An extra 10 minutes of physical activity can help prevent locomotive syndrome. Here are some of the things you can try.

- Bicycle or walk to work.
- Take the stairs instead of the elevator or escalator.
- Clean and launder with zest. Stretch when you have a moment.
- Do locomotion training or stretching while watching TV.
- Take a walk during breaks at the office.
- Walk to a supermarket further away than usual for your shopping.
- Use your local park or sports center.
- Take part in community sports events.
- Go out to have fun with family or friends on days off.
- Walk briskly with long strides.

In fact any form of exercise can help prevent locomotive syndrome — radio gymnastics, community exercise programs, you name it.

SOURCE: Ministry of Health, Labour and Welfare, Activity Guide 2013.

Got a sore back or knees?

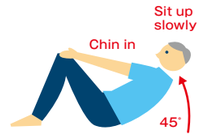
These exercises can help bring relief!

If you have pain or other symptoms, consult with a medical professional before trying these exercises.

Exercises for back pain

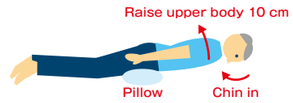
1 Half sit-ups

Lie facing upward. Keeping your chin in, slowly raise your upper body to a 45-degree angle and hold for 5 seconds. (You don't need to sit up that far if you lack abdominal strength.) Raise your upper body by tensing your abdominal muscles.



2 Back stretches

Lie face down with a pillow under your belly below the navel. Keeping your chin in, slowly raise your upper body about 10 cm off the floor and hold for 5 seconds. (You don't need to raise your body that far if unable to do so.) Raise your upper body by tensing your back muscles. This exercise is even more effective if you tense your buttocks at the same time, putting your glutes to work as well.



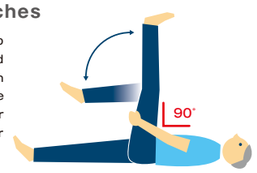
1 2 Do at least two sets of ten of each exercise per day.

3 Hip, back, and ab stretches

Lie facing upward. Grasp one knee with both hands and slowly draw it toward your chest while taking a deep breath. Hold for 10 seconds. Repeat with the other knee.

4 Hamstring stretches

Lie facing upward. Bend the hip joint of one leg 90 degrees and hold the back of your thigh with both hands. Bend and stretch the knee, then slowly extend it as far as you can and hold it there for 10 seconds.



3 4 Do at least two sets of ten of each exercise per day.

SOURCE: Japan Low Back Pain Evaluation Questionnaire (JLEQ)

Exercises for knee pain

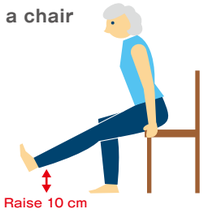
Toning the quadriceps (the muscles at the front of the thigh)

■Performed lying face upward

Lie facing upward with one knee bent at least 90 degrees. Slowly raise the foot of the other leg 10 cm off the floor with the knee straight. Hold for 5 seconds, then slowly lower it. Once it's back on the floor, rest for 2-3 seconds. Repeat with the other leg.

■Performed sitting on a chair

Sit on the edge of a tall chair while holding on to the sides. Keep one foot on the floor and position the other leg with the ankle at a 90-degree angle and the knee straight. Maintaining that position, raise the heel 10 cm off the floor and hold for 5 seconds. Then slowly lower it. Once it's back on the floor, rest for 2-3 seconds. Repeat with the other leg.



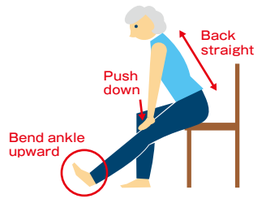
Do at least two sets of twenty of either exercise per day.

SOURCE: Japanese Knee Osteoarthritis Measure (JKOM)

2.Knee flexions and extensions

■Knee extensions

Sit on the edge of a chair. Place your hand on your thigh just above the kneecap and extend your knee by slowly pushing down as much as you can without causing pain. To stretch your calf more, bend the ankle upward at the same time. To stretch the back of your thigh more, keep your back straight and bend at the hip joint. This exercise is most effective performed when your body is warm, as after a bath.



■Knee flexions

Grasp your ankle with both hands and slowly draw it toward your buttock, bending the knee as much as you can without causing pain.

Perform each exercise for 15-30 seconds, repeating 1-3 times.

Once you've exercised, you need to get proper nutrition too. What kind of diet is best for preventing locomotive syndrome?

Being overweight and underweight are both causes for concern! Keep your musculoskeletal system healthy by eating properly.

One in two men and one in five women of middle age or older in Japan have metabolic syndrome or are at high risk of developing it. Metabolic syndrome can result in hardening of the arteries, placing you at risk of life-threatening conditions such as heart disease, but that's not the only thing that's scary about it. If you're overweight, the excess pounds put extra strain on your back and knees, which can lead in turn to locomotive syndrome.
On the other hand, insufficient nutrition due to dieting or lack of appetite reduces bone and muscle mass. Of particular concern are the excessive desire of young women to be thin and the failure of many seniors to get adequate nutrition. If you don't want to fall victim to locomotive syndrome, it's important to be careful about what you eat so you don't become either overweight or underweight.

The key: obtaining a balanced combination of all five major nutrients by eating three proper meals a day.

So what's the best diet for preventing locomotive syndrome?
To lead a healthy life there are certain nutrients we all need: carbohydrates, fat, protein, vitamins, and minerals. These are termed the "five major nutrients," and they're indispensable to keeping the musculoskeletal system in good working order. It's important to replenish each of them by eating three proper meals a day.
A proper meal should consist of three elements: a starch dish with plenty of carbohydrates, such as rice, bread, or noodles; a main item with plenty of protein, such as meat, fish, egg, or soybean products; and a side item with plenty of vitamins and minerals, such as a garnish of vegetables or seaweed. Eating three meals a day, each consisting of a starch dish, a main item, and a side item, and supplementing them with milk, dairy products, and fruit, is the best way to obtain a balanced combination of all five major nutrients.

As long as your diet is balanced over the week, that's fine. Not being too strict is the secret to sticking to a proper diet.

If your mornings are so hectic you don't have time for a proper breakfast, you can still improve your nutritional balance by having a glass of milk or fruit with your toast, or consuming a bowl of miso soup with your rice ball. You may find it difficult to have a starch dish, a main item, and a side item with every meal. In that case balance things out over the course of the whole day or, if even that's difficult, over the course of the week. The important thing is to get all the nutrition you need from the food you eat.

Make mealtimes more fun by adding variety to the menu or dining with company!

No matter what your age, an irregular diet can eventually disrupt your natural biological rhythm, heightening your risk of developing health problems. So if you have poor eating habits, the first thing you need to do is consider ways to improve your lifestyle. Malnutrition among seniors in Japan has become a serious concern over the past several years. You tend to lose your appetite as you get old, so it's a good idea to get the missing nutrients by having a snack in the morning and afternoon in addition to your three regular meals.
You may need to find ways to stimulate your appetite so you obtain all the nutrition you require. You can add variety to your menu by switching between Japanese, Chinese, and Western cuisine, or jazz up your meals by adding brightly colored vegetables. Also effective is dining with family or friends, going to a restaurant, or eating lunch outdoors, such as in the park. Or serve meals on nice crockery and turn them into a feast for the eye. There are so many ways to make mealtimes enjoyable.

Health tips — The three keys to preventing locomotive syndrome through diet

Shoji Shinkai
Nutrition Working Group, Locomotive Challenge! Council
(Team Leader, Tokyo Metropolitan Geriatric Hospital and Institute of Gerontology)

Key① Beware of undernourishment!

Among the elderly, people who are thin or have a low level of nutrients (such as albumin) in the blood tend to require nursing care sooner. Such a state is termed undernourishment. Undernourishment can easily lead to osteoporosis and sarcopenia (loss of muscle tissue), so preventing it is critical. A useful indicator here is your dietary diversity score (Figure 1). You should if possible eat items from all ten food groups every day. Assign a score of 1 for food categories you eat almost every day and 0 for those you eat less often. It's an established fact that people with a higher total score are less susceptible to undernourishment, maintain stronger muscles and bones, and walk faster and have stronger grip (Figure 2).

Key② A main item & side item each meal, plus milk or dairy & fruit daily

Every meal, be sure to have a main item (like meat, fish, eggs, or soybean products) and a side item (like vegetables, mushrooms, or potatoes) in addition to a starch dish (like rice or noodles). Also, consume milk or dairy products as well as fruit every day.

Figure 1

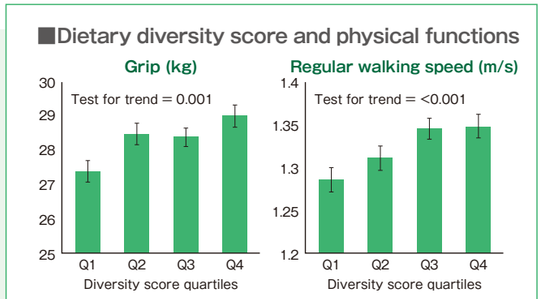
■Dietary diversity score — Eat almost every day : 1 point; Eat less often : 0 points

1.Meat	pts.	6.Green and yellow vegetables	pts.
2.Fish and shellfish	pts.	7.Seaweed	pts.
3.Eggs	pts.	8.Potatoes	pts.
4.Soybeans and soybean products	pts.	9.Fruit	pts.
5.Milk and dairy products	pts.	10.Dishes made with oil	pts.
Your score ----------→			pts.

(Prepared by Tokyo Metropolitan Geriatric Hospital and Institute of Gerontology)

The higher your score, the less your risk of undernourishment!

Figure 2



Sample: 1,063 ordinary seniors living at home
4 diversity score quartiles: Q1=0-2 pts., Q2=2-4 pts., Q3=4-6 pts., Q4=6 pts. or above
Data: Average (adjusted for sex, age, region, and BMI) ± standard margin of error
(SOURCE: Yokoyama et al., J Nutr Health Aging 2015 (in press), slightly modified)

Key③ A diet for stronger muscles and bones

On the next two pages you'll find detailed information on nutrients particularly vital to preventing osteoporosis and sarcopenia (loss of muscle tissue), both causes of locomotive syndrome.

Next page: a diet for stronger muscles and bones!

The raw materials from which bone and muscle are formed come from your daily meals. So keep locomotive syndrome at bay by following a proper diet.

Vitamin D is produced by the body through exposure to sunlight. So in addition to getting proper nutrition, on a sunny day go out for a walk or some exercise.

Build stronger bones by eating right

Your bones are constantly being regenerated, so they require a steady supply of the right raw materials.

As bones get old they're broken down and replaced with new bone, so they're constantly being regenerated. If not enough of the raw material from which they're made is available, the bones become porous (the condition called osteoporosis) and susceptible to fractures. The most important of the nutrients from which bones are built is calcium, which Japanese tend not to get enough of. To prevent osteoporosis, it's recommended that you get 700-800 mg of calcium a day. So be sure to include things that contain lots of calcium in all three meals a day — like milk and dairy products, small fish, brightly colored vegetables, seaweed, and soybean products.

Besides calcium, also get plenty of protein, vitamin D, and vitamin K.

But you need more than just calcium to build strong bones; you also need protein, vitamin D, and vitamin K. Protein is one of the building blocks of bones, so be sure to get enough of it. Meat, fish, milk, and soybeans are all sources of high-quality protein with a good amino acid balance. Vitamin D, which increases absorption of calcium in the gut, occurs in large amounts in fish like salmon as well as mushrooms. It can also be synthesized in your skin during exposure to sunshine, but it's important to obtain plenty in your diet so you don't go short. Vitamin K, which plays a role in forming bones and maintaining bone quality, occurs in large amounts in natto (fermented soybeans) and greens. Other nutrients critical to formation of bones include magnesium, vitamin B6, vitamin B12, and folic acid, all of which you should get as an integral part of your daily diet. Magnesium occurs in large amounts in soybean products, seaweed, and seafood. Vitamin B occurs in large amounts in liver, chicken, and skipjack and tuna; Vitamin B12 in liver, saury, and asari (Japanese littleneck clams); and folic acid in vegetables like spinach and garland chrysanthemum as well as strawberries.

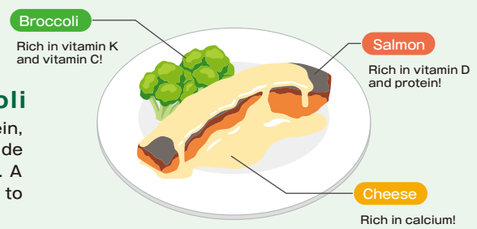
Avoid overconsumption of sodium, phosphate, and caffeine, which impede calcium absorption!

The food additives used in processed and vacuum-packed foods contain lots of phosphate, which when consumed in excess can impede absorption of calcium. Too much sodium and caffeine can cause calcium to be flushed out of the body in urine. So for the sake of healthy bones, avoid overconsumption of instant foods and coffee, and try to cut down on salt.

Practical tips | A dish good for building bone

Salmon cheese bake with broccoli

Fillet of salmon, a rich source of vitamin D and protein, topped with calcium-packed cheese. Serve with a side of quickly boiled broccoli, a source of vitamin K. A simple, tasty way to obtain the nutrients essential to healthy bones.



Build stronger muscles by eating right

If you don't get enough energy, you'll become emaciated and lose muscle mass.

No matter how much you exercise, if you don't eat properly, you'll become emaciated and lose muscle mass. As with your bones, an adequate supply of the right raw materials is necessary to increasing muscle mass and strength. The most essential nutrient in this regard is protein, but it's also important to obtain plenty of carbohydrates and fat, which supply energy. That's because if your body doesn't get enough energy, it will try to generate it using the protein from which your muscles are formed.

Obtain protein from a combination of sources.

Meat, fish, eggs, dairy products, and soybean products are typical good sources of protein. Protein is a nutrient made up of twenty-odd amino acids, of which nine cannot be synthesized by the body and must therefore be obtained from food (these are called essential amino acids). Animal protein is digested more efficiently than plant protein, but it's important to eat a combination of sources, because different foods contain different amounts of essential amino acids. Older people are especially encouraged to get plenty of protein, since they tend not to consume enough meat and eggs.

Protein and vitamin B6 are best obtained together.

Vitamin B6 is the nutrient that promotes breakdown and synthesis of protein. It's a good idea to consume protein in combination with rich sources of vitamin B6 like lean tuna, skipjack, red bell pepper, kiwi, or banana. It's important to obtain protein in all three meals a day.
Muscle mass declines at a rate of 0.5-1% from your forties, but you can take preventive action by doing regular moderate exercise and obtaining proper nutrition. So start doing whatever you can today to ensure you'll walk on your own two feet for life.

Practical tips | A dish good for building muscle

Sweet-and-sour pork

Sweet-and-sour pork is a great dish for efficiently building muscle, since it combines pork, a source of protein, with red and yellow peppers, a source of vitamin B6 and other vitamins. Plus the sweet-and-sour flavor stimulates the appetite.