

Tests and Exercises for the Spine

Peter Fischer



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Tests and Exercises for the Spine

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Preface

Currently available exercise books are lacking clear, test-based guidelines for the design of an efficacious, preventive, safe, and independent exercise program. These books only offer a multitude of exercises without any guidance on how these exercises can be meaningfully used. But “meaningful” does not mean doing any hundred exercises; it means doing the three that really help. It is also meaningful to select exercises not only because they ease the symptoms in the short term, but also because they eliminate the causes of the symptoms (e.g., a bad posture). This is the only way to exercise the spine into a healthy state and keep it fit.

So that this goal can be achieved time efficiently and with ease, I have developed the following spinal fitness check on the basis of 25 years of clinical and scientific work experience in physical therapy, both in Germany and the United States.

I wish you a healthy spine, great success in treatment and prevention, and, last but not least, fun.

Peter Fischer, MTC, MSPT, DPT

About the Author

After completing German Physical Therapy School in 1986, Peter Fischer moved to San Francisco, California, where he worked as a physical therapist in the outpatient clinic of the University of California San Francisco Medical Center and earned his MSPT and DPT degrees.

His research interest was identifying the qualities that a healthy spine requires and how these qualities may be acquired. In order to simplify spinal diagnosis and therapy, he has developed various instruments that are now sold worldwide: PALM (Palpation Meter, www.spineproducts.com), Posture Trainer (www.posture-trainer.com), and the diagnosis and exercise concept of this book (www.spinal-fitness.com).



Peter Fischer

In 1998, Peter Fischer opened a clinic in Germany specializing in the treatment of the temporomandibular joint, head, and spine. His practice team consists of 15 physical therapists. Definition of the treatment goals, monitoring of progress toward the goals, and communication of the results to the patient and the referring physician are part of his practice quality management.

Peter Fischer teaches the scientific basis and practice of physical therapy for the Faculty of Medicine of the University of Tübingen, Germany. His teaching duties for the university include the improvement and maintenance of spinal fitness for students, physicians, and staff. He provides the same services internationally for companies, public employers, schools, and sports teams, using the methods shown in this book.

In addition, Peter Fisher teaches the “Spinal Fitness Check” for the German Physical Therapy Association. In this course, he instructs physical therapists on how to apply the lessons outlined in this book to both individual patients and groups. Aside from training in the clinical application of the tests and exercises, the course also covers relevant aspects of biomechanics, differential diagnosis, and professional communication. If you would like to organize a course, please email the author directly at fischer@praxis-f.de.

Essential Whys and Hows of Training and Testing

1 Why Exercises, Tests, Patient Language, and Navigator

In this book, you will find tests and exercises for posture, relaxation, movement, coordination, mobility, strength, and endurance, all of which are needed for a completely fit and healthy spine.

3 in 1

Diagnosis, treatment, and instructing the patient how to exercise independently can be carried out in one step. In addition, a navigation system indicates the right tests and exercises for any given area of symptoms and dysfunctions.

1.1 Why Do Exercises?

Exercises provide a more effective and lasting improvement for most functional disorders of the spine than does manual treatment alone. In addition, instructing a patient on how to eliminate a problem through exercise relieves the therapist, both physically and in terms of time management. One of the most frequent results of physical stress on the therapist is carpometacarpal joint arthritis. This results from our attempts to straighten or loosen something with our fingers that will be just as crooked and tight at the next appointment if the patient does not exercise. For this reason, the author nowadays uses manual techniques only for diagnosis and in those rare cases in which exercise alone is not enough (see Chapter 11).

Long-term efficacy

Therapists who work principally with exercises and only use manual techniques as a backup measure are more successful and have fewer symptoms themselves.

1.2 Why Perform Tests?

1.2.1 Efficacy

Every exercise in this book is preceded by a test that tells you whether or not the exercise is important for your patient. This distinction between important and unimportant exercises, allows for an effective and *time-efficient focus on the right exercises*.

1.2.2 Prevention

The tests help to find and correct weak points *before* they become apparent as pain and obvious impairment. This is considerably simpler and more efficacious than correcting weak points that have become so pronounced that symptoms have already developed.

1.2.3 Time Efficiency and Safety

The tests will also tell you when your patient has become adequately fit that she can decrease the frequency of an exercise or stop it altogether. This too saves time and *protects against injury resulting from excessive training* (e.g., instability caused by exaggerated mobility training or overloading through too much strength training).

1.2.4 Motivation and Responsibility

The tests let you see the progress that is being made through exercise. This visible success motivates the patient to keep on exercising. If the patient has not made any progress because she has not exercised, this will also become evident in the test and make it clear that improvement is needed in exercise discipline rather than in the therapist's choice of exercises. Thus, the test allows you to make the patient responsible for her own health: the success of the exercise plan depends on the patient's diligence in carrying it out. The therapist is required to reconsider his treatment plan only if the patient shows no improvement in her well-being or her function despite making significant progress toward a test goal.

First question

The first question to ask the patient should always be about exercise compliance. Only after you have an answer to this question does it make sense to ask whether her symptoms have changed.

1.2.5 Approval

The tests also increase diligence in exercising because your patient wants to make a good impression on you, knowing that the retest at the next appointment will show just how much or how little she has exercised.

1.3 Why Is the Exercise Always the Same as the Test?

When the exercise and the test are the same, the three tasks of “*diagnosis, treatment, and exercise plan*” can be carried out in one step. This saves time and ensures that the structure that has tested positive is exactly the one that will receive training. For instance, if the test for posterior thigh flexibility (p. 101) reveals insufficient flexibility, the treatment and home exercise program will consist of having the patient remain in the test position until the tension decreases. Regardless of whether the resistance is caused by muscle tension, connective tissue contracture, impaired neurodynamics, or a combination of these, this stretching exercise will always mobilize precisely those structures that are blocking the free mobility of the posterior thigh.

But if the diagnostic test and the treatment are not the same, the wrong structure might be treated. For instance, if the test for posterior thigh flexibility (p. 101) shows insufficient flexibility and the therapist suspects that the cause is impaired neurodynamic mobility in the intervertebral foramen between L5 and S1 and mobilizes this segment, he may be wrong. If the resistance is in fact a contracted ischiocrural muscle, his mobilization will have no effect.

1.4 Why Establish a Differential Diagnosis?

A differential diagnosis makes it possible to find the causes of a problem. This is a requirement for any efficacious treatment. Another important objective of differential diagnosis is to recognize whether a patient's symptoms are caused by a disease process that cannot be treated with physical therapy. In this case, the differential diagnosis allows us to refer the patient to a physician in the appropriate field, where she can be helped.

1.5 Why are the Tests and Exercises Written in Patient Language?

As opposed to all the remaining sections that are addressed to the therapist, the sections Test, Exercise, and Alternative Exercises are written in patient language. This distinction was made because the exact wording in patient instruction matters in reaching the objective of the test or exercise. The wording of the patient instructions presented in this book is based on years of everyday practical experience and the positive results of extensive monitoring, testing, and adaptation. The therapist may use this wording when directly addressing a patient or to bridge a short, unexpected break. A therapist who needs to take a call during treatment could ask the patient, for e.g., to “read and do this exercise within your range of comfort.”

1.6 Why an Exercise Book with a Navigator?

The treatment navigator is an image of a human being in which individual body parts are numbered. If a patient presents with symptoms or dysfunctions in a specific area, the respective number directs the therapist to a series of tests and exercises that are most likely to detect and eliminate the cause of the respective symptoms or dysfunctions. The selection and order of the recommended tests and exercises are based on the author's 25 years of experience using the test and exercise system in this book. As in driving using a GPS, some people will be pleased with this orientation aid, whereas others would rather find their way alone.

2 Essential Training and Testing Q + As

- **How important are the following Q + As?**

The information in this chapter is essential for the safe and effective application of the tests and exercises in this book.

- **What is the difference between test and exercise?**

Almost none. The exercise is an attempt to pass the test.

- **Which exercises should your patient do?**

Only those exercises for which she cannot yet pass the test.

- **How often and how long should one do mobility, strength, and endurance exercises?**

- Mobility: once a day, until the tension relaxes and/or the mobility increases noticeably.
- Strength: three times a week until fatigue of the muscle group is sensed.
- Endurance: two or three times a week for 30 to 60 minutes.

- **How much extra time is required to practice good posture, relaxation, movement, and coordination?**

None. They should be a constant companion in everyday activities and become habitual.

- **How long should the daily practice of mobility, strength, and endurance exercises take, at most?**

Only a daily exercise program with a realistic time commitment has any chance of being followed regularly. To be realistic, the therapist should always ask the patient how many minutes a day she can picture herself exercising regularly and for the long term. The daily program should not take longer than that.

- **And if the test results recommend more mobility, strength, and endurance exercises than the patient is willing to do?**

If the patient does not have enough time or motivation to do all the mobility, strength, and endurance exercises for the test she was not able to pass, the therapist should decide which of these exercises are especially important.

Selection criteria

Two criteria for the importance of an exercise are (1) how far the patient is from achieving the test objective and (2) the degree of symptomatic relief that occurs immediately after completion of the exercise.

Another way to reduce the time spent on daily exercises is not to do all the selected mobility exercises every day but to divide them into two groups that are done on alternate days. Finally, many mobility, strength, and endurance exercises can be integrated into everyday activities without additional time expenditure. For instance, many exercises can be done while telephoning, watching television or standing in the elevator.

- **At what time of day should your patient exercise?**

It is a good idea to have a fixed exercise time, such as immediately on arising, before going to bed, or during the television news. Another possibility is to connect exercises to specific daily situations, for example “When I’m on the phone, I always lie down on my back and stretch the back of my thighs on the door frame.”

- **When is your patient doing an exercise correctly?**

If she is getting closer to the test objective, for instance if she is becoming more mobile as a result of mobility exercises. In part, your patient will be able to feel this progress. However, for professional communication with the physician and patient, you should also document your patient’s progress by entering the initial and subsequent test results in the treatment plan.

- **Which exercises are unnecessary?**

If your patient passes a test without having exercised, the corresponding exercise is not necessary.

Warnings and Contraindications

General warnings and contraindications are described under “Which exercises should your patient not do?” below. Make sure to read this entry along with the other Q + As of this section carefully before beginning with any of the tests or exercises in this book.

Specific warnings and contraindications are also found in various sections (e. g., “exercise” or “biomechanics”) of the respective test or exercise. Therefore make sure to carefully read the entire chapter before the application of a test or exercise.

- **Which exercises should your patient not do?**

She should not do any exercises that her physician has advised her not to do or that cause or intensify her symptoms. If exercises cause or intensify symptoms, they should immediately be replaced by alternative exercises that do not cause any discomfort.

In cases of rheumatoid arthritis, Down syndrome, or long-term cortisone treatment, or after trauma to the cervical spine, such as whiplash trauma, you should first

ask your patient's orthopedist whether the chin tuck included in the following exercises is contraindicated: chin tuck mobility (p. 70), thoracic extension mobility (p. 73), hip flexion mobility (p. 95), buttock muscle flexibility (p. 96), and abdominal and anterior neck muscle strength (p. 117). In the case of pregnancy, disease, illness, trauma, or surgery, you should obtain permission from your patient's physician before beginning with any of the tests or exercises in this book.

- **How fit does your patient have to be in order to pass all the tests?**

The tests are based on experience-based measures of posture, relaxation, movement, coordination, mobility, strength, and endurance that unlimited spinal function requires.

- **Should elderly individuals be expected to pass all the tests?**

The fitness curves on page 194 clearly show how the progression from the “teens” (age 10–19) to the twenties (age 20–29) is associated with a significant loss of posture, relaxation, mobility, strength, and endurance. With the exception of a more pronounced loss of relaxation in women in their twenties, this development affects both sexes to the same extent. After this time, only men show a loss in fitness. From the age of 50, mobility and strength in men decreases.

In the twenties, losses in fitness can be completely recouped through disciplined exercise. But as the bones and joints undergo degenerative changes with increasing age, passing all the mobility tests becomes less and less feasible. At this point, the treatment objective should be for the patient to decrease her distance from the test goals rather than to reach them. For instance, a 60-year-old patient who has not been training will hardly be able to regain the mobility she had when she was 20. But she could manage to regain the mobility she had 10 years ago. With the therapist's help, the frustration that some older patients experience when they see how much function they have lost should be transformed into motivation to “exercise their bodies 10 years younger,” that is, to make the distance from the test goal (p. 179) a little smaller. Instead of aiming at the unreachable 100%, it makes more sense to show the patient the aging curve and to give her the goal of moving a decade to the left on this curve. If you direct your patients to this attainable 10-year goal and the corresponding standard, you will be able to motivate and reassure them.

- **How important is it to pass the tests?**

It is not the most important thing for your patient to ever pass a test completely. It is more important for the tests to point to the correct selection of exercises by differentiating between relevant and irrelevant exercises. Depending on body type, previous injuries, surgery, or disease, it may even be impossible for the patient to

pass a certain test. Therefore, your patient should never use force while exercising but should gently move toward the test goal as far as is beneficial. Usually, the patient will already feel an improvement simply from getting a little closer to the goal. An overall guide to measuring your patient's progress toward the test goal is provided on page 179.

- **When can your patient reduce the frequency of or even stop the performance of an exercise?**

- Posture, relaxation, movement, and coordination: These exercises should be carried out until they become habitual.
- Mobility and strength: If exercising has made your patient fit enough to pass strength and mobility tests she could not previously pass, she should try to determine whether exercising less often is sufficient to maintain the strength or mobility she has achieved. To try this out, reduce the exercise by one session a week. As long as the patient continues to pass the test, the reduced exercise frequency is sufficient. If at some point a patient can pass the test without exercising at all, that exercise has become unnecessary and can be deleted from the program.

If a deficiency is the result of age, continuous training will generally be necessary to maintain the strength and mobility regained through therapy. If the cause was only deficient posture, relaxation, movement, or coordination, correction of these aspects will make the corresponding strength or mobility exercises superfluous. With limitations due to surgery or injury, the outcome is less predictable, and time will tell whether and when the patient can decrease or stop certain exercises.

- Endurance: Endurance training should be maintained for good.

- **In what order should your patient perform mobility, strength, and endurance exercises?**

Ideally, in the following order: mobility, followed by strength, and finally endurance. Mobility exercises can be performed alone, but strength and endurance training should always be preceded by mobility exercises to prevent degenerative changes. If strength and endurance training causes undue muscle tightness, a follow-up with mobility exercises for relaxation may also be useful.

- **Which exercises are the most important?**

For a healthy spine, it is most important for a patient to cultivate the right posture, relaxation, mobility, and coordination in the course of daily life. If these areas are in order, many symptoms will disappear spontaneously. If they are not, additional mobility, strength, and endurance exercises may be required. The most important of these is mobility, followed by strength, and finally endurance.

- **How do I know which exercises are right?**

- If an initial test is passed, the patient should not be assigned the corresponding exercise.
- If symptoms or dysfunctions have not improved even though the test goal has been achieved in the course of training, the corresponding exercise should be discontinued.
- If the test has not been passed but the symptoms improve with the corresponding exercise, the exercise should be included in the exercise program and performed until the test is passed. When the symptoms have disappeared completely, no additional tests and exercises are necessary. If the test goal was achieved but the symptoms have not disappeared completely, continue with the next test in the selected Navigator (p. 146).
- If an exercise is performed incorrectly, results in no progress toward the test goal, or cannot be performed at all, check the troubleshooting section for possible solutions. You can only determine whether the exercise is efficacious if it is performed correctly.

- **How soon should symptoms disappear with the right exercise?**

If a mobility exercise is efficacious, the symptoms should disappear *immediately* after the improvement of mobility, that is, as soon as tension is relaxed while the body position is unchanged. The ability to perceive the relaxation and maintain the position does, however, require a certain amount of body awareness. In all other categories (posture, relaxation, movement, coordination, strength, and endurance), an effect should be noticed after at least 6 weeks of regular exercising. If no further compensatory mechanisms have set in and the exercises are done correctly, symptoms and functions may, however, improve spontaneously.

- **Why are all unilateral tests and exercises only described for the left side?**

Tests and exercises that are performed individually for each side of the body are described for only one side (the left side) for reasons of brevity and clarity. Naturally, they are also to be performed analogously on the other side. For instance, if your patient passes one of these tests on the left side but does not pass it on the right side, she will need to do this exercise only on the right side.

- **What kind of equipment do you need for training?**

Only things that are already there: a chair, a door frame, a free section of a wall or door, comfortable clothing, and a gym mat or blanket. For some exercises, a rolled-up towel or a cushion is also recommended. Finally, a mirror is helpful in learning the technique of abdominal breathing.

- **How can you determine whether your selection of exercises has been efficacious?**

To determine how efficacious the exercises are, the therapist can document the patient's progress toward the test goals and the overall therapy goals (in terms of symptoms and function) in the treatment plan (p. 189).

- **How can you set up a professional exercise program for your patient?**

When you visit www.spinal-fitness.com, you can download or printout a treatment plan for yourself and an exercise plan for your patient. You will find these downloads under "Information for therapists, trainers, and physicians." You can check off the exercises your patient should do on the exercise plan (p. 188).