

NEUROATHLETICS FOR RIDERS

A woman in equestrian attire, including a dark helmet, a dark polo shirt, and light-colored breeches, is sitting on a brown horse. She is holding a green apple in her gloved hand. A man in a dark polo shirt is kneeling beside the horse, adjusting the saddle. In the background, there are green trees under a blue sky. A large, glowing, semi-transparent brain graphic is overlaid on the top half of the image, with white lightning bolts emanating from it.

Innovative
Exercises That
TRAIN YOUR BRAIN
and
CHANGE YOUR NERVOUS SYSTEM
for Optimal Health and Peak
Performance

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👉 *Table of Contents*



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"RIDING ISN'T A SPORT"

I come from a family of riders. The women hung out at the barn, with me in the weight room. Sometimes I was allowed on a horse, but I always just cantered around, which the women didn't seem to appreciate.

"Riding isn't a sport," I'd say. "The horse does all the work. Do some fitness training!"

"Marc, you haven't got a clue!" they'd reply. "And anyway—when, exactly? We don't have time!"

The women didn't want to hear it. After all, who's interested in the opinions of a 13-year-old? For me, it was crystal clear—they could be better if they trained their own bodies as well as their horses. And riding would also be safer for them. However, this thought only came to me much later.

As a ski jumper, I knew that if you are messing around, unprepared, not warmed up, unfit, or your mind is elsewhere, you'll soon end up falling. And it's no different with riding, except you'll fall off a horse and not a ski jump.

Accidents can be caused by external circumstances, by your own errors, or by a combination of both. However, ski jumpers have perfect control over their bodies. Horses all over the world are ridden by people who lack even basic skills. They can move their bodies with precision around the supermarket, but not in extreme situations. The risk of accidents increases because these people are less able to respond to unexpected problems.

I can picture my mother in the hospital, her upper arm completely shattered, full of wires and suspended in traction on a hospital bed. Her face was swollen and bruised, blue and green. Could the fall have been avoided if she trained her mind and body *off*

the horse to be more fit on him? It's a shame to have to give up something you love. You lose a part of yourself. I know that.

CONCUSSIONS CAN BE DECEPTIVE

Bam! The two pounds in your head are flung back and forth like Jello in a bowl. Your brain function may be disturbed for a short time afterward.

"What's your name? What day is it today? What year is it? Do you feel sick?"

Even if somebody has symptoms, diagnostic imaging such as computerized tomography (CT) scans or magnetic resonance imaging (MRI) usually do not reveal any visible findings. The deceptive thing is that, as the result of a chain reaction of metabolic responses and inflammations, the brain enters an "energy crisis" that can last for several weeks.

The consequence is slow changes in the brain. It's equally deceptive that it happens so slowly that the patient doesn't associate the symptoms with the concussion. Strange things happen—and you don't know why (Pearce et al. 2015; Giza and Hovda 2014; Simpson-Jones and Hunt 2019).

Constant tiredness. Pulse rate through the roof. Anxiety. Needing to wear glasses. Headaches. Dizziness. Even worse, a diagnosis of Parkinson's disease may follow two or three years later. It's not unusual, and the link is proven (Gardner et al. 2018; Abu

Talh et al. 2017; Delic et al. 2020). Like rugby players, downhill skiers, motorcycle racers, and racecar drivers, horseback riders are in a group of athletes at high risk for concussions. But do you know how fit the other athletes in this group are? And how hard they train themselves physically and mentally? That’s why they usually recover well. This is not the case with riders. Riders suffer for a long time. And most riders don’t know anything about the possible long-term consequences.

PREVENTION

There are millions of riders in the world, both active and occasional. Consider how many potential concussions that can be per year! How many people ride through life with long-term consequences?

Prevention isn’t sexy, that’s for sure. But what if you could get even better and have even more fun riding by training in ways that would reduce accidents? What if your horse would thank you for it if he could?



CONCUSSIONS IN RIDERS

A US study surveyed 115 riders, all of whom had experienced a fall as well as several head injury symptoms. 44% revealed that they had been concussed at least once. They reported the following symptoms (Kuhl et al. 2014):

Neck pain 63.8%	Headaches 56.4%
Dizziness 43.6%	Poor balance 27.7%
Difficulty concentrating 24.5 %	Loss of consciousness 23.4%
Tiredness 23.4%	Irritability 23.4%
Feeling of slowing down 20.2%	Numbness/tingling 19.1%
Brain fog 17.0%	Memory problems 17.0%
Sensitivity to light 16.0%	Nausea 16.0%
Blurred vision 14.9%	Sensitivity to sound 13.8%
Sleepiness 12.8%	Vomiting 10.6%
Ringing ears 10.6%	Amnesia 10.6%
Sadness/depression 8.5%	Problems sleeping 8.5%



A vibrating disposable toothbrush held against the upper arm improves the rider's perception of the arm, enabling her to control it better.



Gait analysis is an essential test that gives the trainer lots of information

WHAT DOES NEURO-RIDER TRAINING DO?

You can use what I call “Neuro-Rider Training” to work on specific issues or to improve your overall performance. You can focus on:

- Coordination and fine-tuning of the aids
- Body symmetry
- Head posture
- Hand position
- Anxiety in certain situations
- Inappropriate/unhelpful emotions
- Inappropriate emotional responses
- Difficulties with rhythm
- Uneven hips
- Shoulder crookedness
- Focus and concentration

NOT “ONE SIZE FITS ALL” TRAINING

I know you want a plan for solving your problems. Everybody wants a plan. Ready-made plans sell well, and for some people, those plans work. But for many people, they don't. For many people, even the best training plans based on the latest scientific findings and experts' experience do nothing. *Nada. Niente.* How can that be?

You might think this is down to not following a plan correctly, or a lack of willpower or consistency. And in one sense, that's true, but it isn't quite that simple. Human brains and bodies may be similar overall, but when it comes down to the details, they're as individual as our fingerprints.

This is because we all have lived different lives, had different or no experience with personal training, eat differently, have different hormone levels, and have suffered different injuries, had different accidents, and overcome different illnesses. Each of these factors potentially affects the nervous system. When you realize this, it should become clear that the same training plan or the same exercise obviously cannot work equally well for everybody.

You won't get any plans here. Sorry. You also won't get a "magic pill" that will do the job for you. Positive outcomes happen remarkably often, but it's impossible to say whether, when, or how fast, because there are far too many different factors in play.

My friend Zachariah Salazar has taught martial arts, guitar, philosophy, physiology, and personal training for 40 years. He says: "People accept that it takes ten years to learn to play the guitar well. They accept that it takes ten years to earn a black belt in karate. They realize that you can't grasp philosophy in a year. But when it comes to health and fitness, they want pills and six-week programs. Health and fitness need to be earned, just like you need to earn a black belt in karate."

Please look at this book as a starting point. It isn't a black belt or a six-week program. You will learn to make better decisions for your health, riding, and general fitness.

In the pages ahead, I'm going to present a selection of exercises, called "drills." You can find out which exercises are right for you by testing them out. I describe how



Even if riders' errors are similar ...



... their ways of solving problems usually aren't.



Flexibility test: The forward bend.



Balance test: Standing on one leg—this test was over after three seconds.

that works in chapter 2, The Principle—Testing and Retesting (p. 47).

Testing and retesting are an important part of the training process. Please be willing to experiment and look at it as a game.

Every physical activity you've done in your life so far—jogging, stretching, yoga,

tai-chi, tango, zumba, CrossFit, soccer, or even “active sitting,” such as on a balance ball, affects your nervous system in some way. However, I think it's very important to understand exactly *how* these tools affect your nervous system, and why they might be helpful or unhelpful.

OBJECTIVES

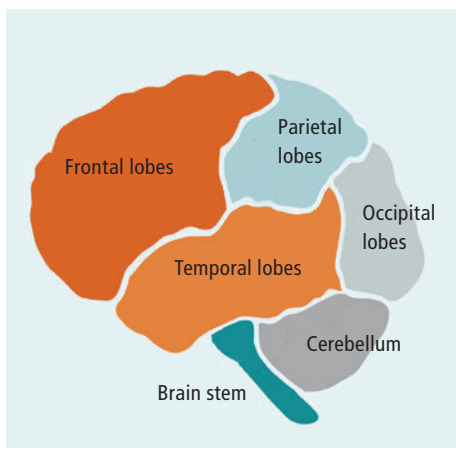
My aim is for you to have learned the following by the end of this book:

- What stimuli there are, and how they differ.
- How the most important body movement control systems work together and influence each other.
- How to recognize your own critical problems and weaknesses.
- Which stimuli are the right ones for you, and how to decide for yourself how and where you start your individual training and what to include in it.
- How to solve your own problems.

“CIB” EFFECTS

I have already seen many riders cry. Magic moments happen when communication between rider and horse is smooth and relaxed—it’s fun! But along with the direct effects on riding, Neuro-Rider Training can also have other, more indirect effects. I call them “CIB effects,” because clients and

Neuro-Rider Training	Classical Training
<i>Teaches principles</i>	Teaches discipline
<i>Following rules or free play</i>	Usually prescribed processes with more linear structure, and rigid pattern
<i>Testing and experimenting</i>	Planned specification of content before the training process
<i>Fun</i>	Consistency
<i>Automatically gives constant feedback</i>	No feedback, only checks on training
<i>Constant feedback and constant adaptation</i>	Feedback and adaptation only during occasional checks on performance
<i>Variable behavior is encouraged</i>	Planned behavior is required



Areas of the brain as seen from the outside. However, the stark visual divisions between areas aren't accurate to reality: all areas of the brain work together.

graduates of my seminars always ask “Could It Be?” questions—for example:

- “Last night I slept through the night again—could it be because of my mental training?”
- “I can see better when I’m driving at night—could it be because...?”
- “I can concentrate much better at work—could it be because...?”
- “I haven’t had any migraines for six weeks—could it be ...?”

- “I’m losing weight even though I’m still eating as much—could it be because...?”
 - “My psoriasis is much better—could it be because...?”
 - “I’m much more relaxed with my horse—could it be...?”
 - “My horse hasn’t had any issues with ‘X,’ ‘Y,’ ‘Z’ since I started—could it be ...”
 - “I feel like I can think much more clearly—could it be ...”
 - “I hardly have any emotional outbursts anymore—could it be...?”
- ... and many more.

And the answer to every “CIB” question is yes! Give your brain the input it longs for, and it will be happy. When your brain is happy, everything works much better. So expect a few CIB effects, and keep looking inside yourself, because if you develop and strengthen the basic neuronal prerequisites for movement, everything in your life will be easier.

OUR BRAINS ARE ALWAYS DOING THREE THINGS

This is obviously a highly simplified description of the brain, but it’s essentially correct in its broad strokes, and useful for understanding training and for putting the exercises in this book into practice in the right way.

1. THE BRAIN RECEIVES INPUT FROM THE BODY AND THE ENVIRONMENT

This input comes from *receptors*, that is, small sensors situated in the layers of our skin, and in our muscles, tendons, ligaments, and even bones. These receptors

supply our brain with information about the movement of our limbs and their position in relation to each other. We also have receptors to monitor chemical changes in the body and temperature changes.

For example, oxygenation from inhaling changes the pH value of our blood, and these changes in pH value in turn control the respiratory system. The retinas of our eyes have light-sensitive photoreceptors that provide input for the visual system. The sensors for sound waves and the hopefully highly sensitive sensors for acceleration and gravity—the metronomes for the vestibular system—are in our inner ears.

2. THE BRAIN PROCESSES AND INTERPRETS INPUT AND MAKES DECISIONS

Like the boss of a large company who’s always checking and evaluating the completeness of reports from various sites and departments, the brain makes decisions about what to do next based on the data it receives, and its own data processing. All of this happens “under the radar” of your conscious perception.

3. THE BRAIN PRODUCES OUTPUT

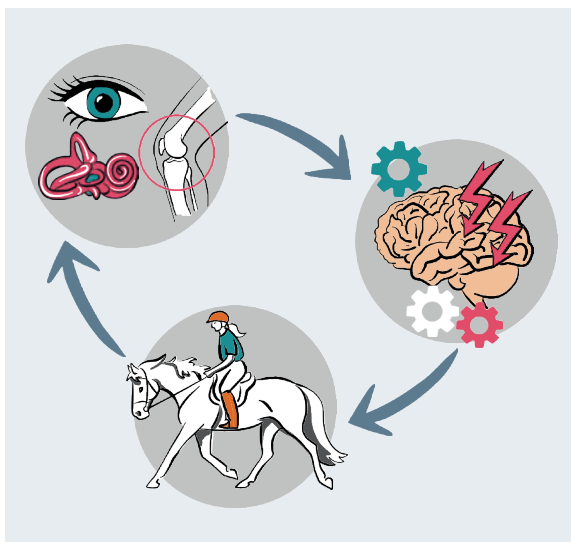
“Output” here can come in lots of forms: An intentional or unintentional movement with a certain quality; symmetry or asymmetry—a sloping shoulder or a wobbly head when riding; a fast or slow, powerful or inhibited movement; or an emotional outburst.

However, an output can also be something that hurts. Pain is output from the brain. Our digestion and our blood pressure are also outputs from our brain, as are the excretion of hormones and the functions of the immune system.

HOW YOU RIDE ...

These three things—receiving input, processing and interpreting input, and producing output—happen in the brain all the time. They form a self-perpetuating cycle. New movements generate new input, which is in turn received and interpreted. On this basis, the brain decides what to do and produces a new output, which in turn generates new inputs, and so on. How you ride is output from your brain.

Think for a minute about your riding. We usually practice movements we want to improve again and again, with conscious effort and conscious control.



Our brain is always doing three things.



The horse's brain is also always doing these three things. One of the inputs is the rider.

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NEURO-RIDER MOVEMENTS — *Let's Go!*



PHYSICAL AWARENESS OR PROPRIOCEPTION

The following applies to all Neuro-Rider Movements: To begin with, start the exercise in a neutral stance with your spine straight, regardless of whether you are doing the drills to improve your physical awareness, sight, balance, or respiratory system.

TRAINING YOUR PHYSICAL AWARENESS

The best way to develop better physical awareness is to control individual joints very precisely, and learn to move them through their full range of movement. We begin with structures at the center of the body before turning to the exercises for the joints of the extremities.

TONGUE MOVEMENTS

Tongue drills are among my absolute favorite exercises. They're very easy to learn and extremely effective, in both the short and long term. You don't need to put in a lot of effort to achieve a big effect. Tongue drills are particularly well-suited to riders because they activate the central cerebellum that is responsible for things like correcting the movements of the spine and eye muscles. Tongue drills also act on the supplementary motor area, an area of the brain involved in preparation for bilateral movement patterns (Scoppa et al. 2020).

But that's not all. From a neuronal point of view, the tongue is a very important interface between an organism and its

environment. We take in food and fluids through the mouth. From an evolutionary perspective, it therefore makes sense that our nervous system has positioned some very finely tuned security checks in our mouths. Scientists all over the world have recognized the importance of the tongue as the "gateway to the brain," and there are many interesting approaches and exercises



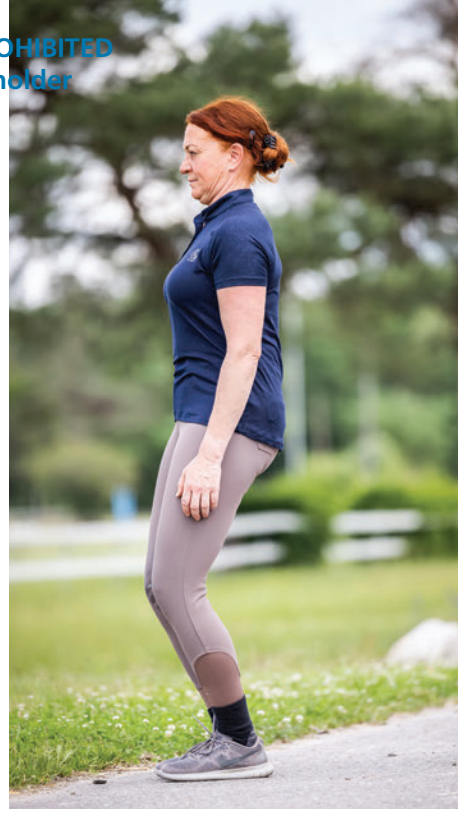
How much strength does the tongue have?

involving the tongue in neural retraining and for rehabilitation after traumatic injuries or illnesses.

Numerous studies show that activating the tongue aids neuroplastic processes and learning. That means that by doing tongue drills before you ride, you can improve your chances of quick and lasting learning.

HOW DOES IT WORK?

The following applies to all parts of the exercise: As mentioned, start the exercise in a neutral position with your spine straight.



First learn how to get into a perfect ...

Step 1	Read the description of the first drill.
Step 2	Do your favorite test.
Step 3	Do the first drill as described.
Step 4	Re-test Step 2.
Step 5	Mark the table under NEUTRAL, REHAB, or POWER, depending on what kind of drill it is according to your test result.
Step 6	Repeat steps 1 to 5 for the second drill.
Step 7	Repeat steps 1 to 5 for the third drill.
...	
...	
Step "n"	Repeat steps 1 to 5 for the "nth" drill.



... neutral standing position (see p. 70).

Tests and Drills Physical Awareness— Proprioception	On page	Result, Left Side			Result, Right Side		
		Neutral	Rehab	Power	Neutral	Rehab	Power
Tongue in Resting Position, Fake Smile, and Swallow	68						
Tongue Circles with the Mouth Closed	68						
Press the Tongue into Right and Left Cheek	68						
Tongue Stretch	69						
Vibration on the Teeth	70						
Neutral Standing Position with the Spine Long	70						
Push the Head Forward	72						
Push the Head Back	74						
Push the Head Left	74						
Push the Head Right	75						
Half No	76						
Yes-Yes Movement	78						
Lateral Bend of the Cervical Vertebrae	79						
The Hen	80						
The Pecking Hen	80						
The Hen in Sideways Position	82						
Bend and Stretch the Thoracic Spine	83						
Thoracic Spine in Sideways Position	85						
Lumbar Spine in Semicircle Forward	86						
Lumbar spine in Semicircle Backward	88						
Straighten and Tilt Pelvis	89						
Pelvic Rotations	90						
Figure Eights with the Hands	91						
Forward Shoulder Circles	92						
Cross-Body Shoulder Circles	92						
Sideways Shoulder Circles	93						
Forward Hip Circles	94						
Cross-Body Hip Circles	96						
Sideways Hip Circles	96						
Backward Hip Circles	96						
Knee Circles	97						
Tilt Ankle Outward	98						
Tilt Ankle Inward	98						
Pull Toes Straight	99						
Pull Toes Out	100						
Isometric Full-Body Contraction	100						



Tip of the tongue behind the incisors ...



... then swallow and "smile."

- Leaving your tongue where it is, start to grin broadly. Breathe in for two seconds and hold this “fake smile” face; then swallow and breathe out slowly through your nose. Hold the grin and swallow five times in a row. A sip of water will help if your mouth gets too dry.
- Retest, and record the result in the table.

TONGUE CIRCLES WITH THE MOUTH CLOSED

Focus on: Feel on the tongue—even movement.

How to do it:

- Try a test.
- Run the tip of your tongue over the outside edge of your incisors and molars, so you’re making the biggest circle possible in your mouth with your tongue.
- As a preparatory or intensification drill: repeat this movement for approximately 30 seconds to a minute. Change direction!
- Retest, and record the result in the table.

TONGUE IN RESTING POSITION, FAKE SMILE, AND SWALLOW

Focus on: Contact surface of tongue on palate—pay attention to the pressure.

How to do it:

- Try a test.
- Place the tip of your tongue behind the incisors on your upper palate, and swallow. Breathe out slowly through your nose. Your tongue will now be in the physiological resting position, against the palate.

PRESS THE TONGUE INTO THE RIGHT AND LEFT CHEEK

Focus on: Even force generation in the root of the tongue.

How to do it:

- Try a test.
- Press your tongue into your right cheek as firmly as possible, with consistent pressure. You can use your hand to exert slight counterpressure from the outside. As a preparatory or intensification drill: repeat for approximately 30 seconds to a minute.
- Retest, and record the result in the table.



During the tongue circles you can ...



.. feel your tongue stretching.



Try to make the circle as even ...



... and as big as possible.

- Repeat the drill, pressing your tongue into your left cheek.
- Retest a second time, and record the result in the table.

palate and press the underside of your tongue firmly against your palate. Hold this position for 30 seconds to a minute.

Retest, and record the result in the table.

TONGUE STRETCH

Focus on: Generate even pressure, feel a slight stretch.

How to do it:

- Try a test.
- Roll your tongue so the underside of the tip of your tongue touches your palate. Now try to bring as much of the underside of your tongue as possible into contact with your



Tongue stretch: stretching and strength exercise.

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EXERCISES FOR THE VESTIBULAR SYSTEM — *Well-Balanced!*



BALANCE AND EQUILIBRIUM

There's a little story I like to tell about a 60-year-old client who ended our telephone call with the words, "You're my last hope!" At our first meeting, she told me that she had pain all over her body.

A TEXTBOOK CASE

She had done far too little exercise over the last 10 years, and she was despairing because of the pain. Pressure at work, constant tension, and insomnia were all making her life hell. So far, nobody had been able to help her. No doctor, no physical therapist. All her vestibular tests were a catastrophic failure. Her proprioceptive abilities were very limited, she wasn't very good at precise movements, and even more significantly, she had no movement in her cervical spine.

I knew there was only a chance of change if the training began with visible success and the homework was easy. She needed vestibular activation, that was clear, but she simply couldn't do the drills correctly with the necessary precision and speed. I decided to test more non-specific drills instead of asking for precise and accurate movement and prescribed more of them. I taught her the Hourglass Exercise (p. 133), and we tested six repetitions—with much better results in retests.

I spent half an hour precisely and accurately teaching her the Hourglass. Her homework was to begin with six repetitions

in the morning, and to do six repetitions in the parking lot every time she arrived somewhere: six at lunchtime, six in the afternoon, and six in the evening. She was to increase it to seven repetitions after a week. Then eight, then ten. We also talked about her diet. She said that she could easily drink a liter of orange juice a day. She also enjoyed roast liver, but hadn't eaten it for a long time. I sent her home with the Hourglass Drills, and a prescription for a liter of orange juice per day and one liver-based meal per week.

Because she had a long drive of two and half hours, I didn't see her again for six weeks. She was a completely different woman. Her pain had decreased from an "8" to a "1." After three weeks, she slept through the night again for the first time, and on the weekend, she'd had a lunchtime nap—which hadn't been possible until now. She told me she had to take a break after two days of training because she had muscle cramps, but that she started training again on the fourth day. She had tested six repetitions step by step and had worked her way up to 40. "I've lost 11 pounds," she told me, smiling. Now she wanted to learn to play tennis and wondered if I thought it was possible.



1



2



3



4

- 1 *The easiest standing position: feet shoulder-width apart.*
- 2 *Feet close together, or the “Romberg stance.”*
- 3 *Feet together but not in line, or the “semi-tandem stance.”*
- 4 *Feet in line, or the “tandem stance.”*

STANDING POSITIONS

- Feet shoulder-width apart.
- Feet close together.
- Feet together but not in line.
- Feet in line, one behind the other.
- Standing on one leg.

It almost brought tears to my eyes. How could it be possible to achieve these changes so easily? We need to realize the vestibular system gives us guidance. It's important. It affects cognition, mobility, stress, sleep, even depression—basically our entire lives (Gurvich et al. 2013; Smith and Zheng 2013; Sailesh, Archana, and Mukkadan 2016). Orange juice counteracts inflammations in the intestine, and the sugar it contains counteracts the stress hormone cortisol. Liver is probably the most nutrient-rich food on earth. Lots of small things can come together to have a big effect.

START SIMPLE— THEN INTENSIFY

Some people need to reduce the difficulty and start off sitting with these drills, which is totally okay. However, most people start learning the drills in a Neutral Standing Position with the feet shoulder-width apart. You can increase the difficulty of the exercise by changing the standing position. This is therefore a way of modifying the dose. Remember – you must get the dose right! As your training progresses, you will be able to tolerate higher doses or maybe even need

Tests and Drills Vestibular System	on page	Neutral	Rehab	Power
Hourglass	130			
Giant Wheel with Gaze Stabilization	132			
Vestibulo-Ocular Reflex in Eight Directions	132			
To the top left				
To the left				
To the bottom left				
To the top right				
To the right				
To the bottom right				
Up				
Down				
Nodding “Yes” While Walking	135			
Nodding “No” While Walking	135			
Heel Bounces with Gaze Stabilization	136			
Head in a Neutral Position				
Head Tilted to the Right				
Head Tilted to the Left				
Figure Eights with Gaze Stabilization	136			

them, so you should increase the difficulty gradually so you can keep improving.

Train to your limit—keeping your balance is supposed to be difficult. It's okay to fail! Work from having your feet shoulder-width apart to keeping them close together, then to the offset stance, then to the tandem stance, and finally to standing on one leg. It's very difficult to do the drills standing on one leg. But when you have reached that point, you're guaranteed not to fall off your horse as easily.

HOURGLASS

Focus on: Stimulation for the vestibular system. This drill could also fit well into the Movement Drill category. I've included it here because it provides very good general stimulation for the vestibular system. After a few weeks of training, you should be able to manage as many Hourglass rotations as your age in years. If you do as many Hourglass Drills as your age in years every day, you'll continue to do very well for many years to come. And yes, you do one more every year! Unfortunately, the effort doesn't get any less as you get older.

Many people are familiar with classic "hip circles," but that's not what I'm talking about here. During hip circles, your head remains completely still, and as a result, the vestibular system is not activated through the *canals*, *sacculus*, and *utricle*. This drill, however, kills two birds with one stone: it combines loads of input from the muscles of the spine and loads of input from the inner ear.

How to do it:

- Try a test.
- Start in Neutral Standing Position. Push your pelvis to the right while you tilt your spine to the left. From this point onward, your pelvis and upper spine always move in opposite directions.
- Your head moves forward and your pelvis moves back—in sync.
- Your head moves from the front to the right, and your pelvis moves from the back to the left.
- Your head moves back, your spine extends, and your pelvis pushes forward.
- Picture it: Draw circles on the ceiling with your head, and circles with your hips underneath. However, your head is always half a circle ahead (or half a circle behind, depending on how you look at it).
- Go slowly to begin with. Make sure your pelvis and head positions always move the same way in relation to each other and are opposite each other.
- Make sure your cervical and thoracic spine really extend, and your head doesn't stay in a neutral position. Your head needs to tilt in each direction—otherwise you won't activate the inner ear.
- Start with three revolutions in each direction. Did I already mention you should begin very slowly, in "slow motion"? And remember to breathe. It helps! Especially if you breathe in rhythm with the movement.
- Retest—but wait until any dizziness has passed. Record the results in the table.

TRAINING TIPS: HOURGLASS

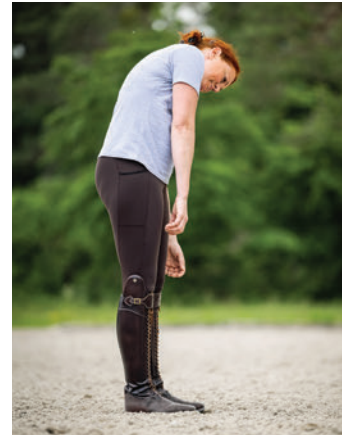
- To begin with, it's easier if you focus on a spot slightly higher than eye level while you do the movement. You can allow your gaze to wander to the ceiling later.
- Dizzy? Have you done a positive test on one of the tongue positions (see p. 68)? Test whether maintaining one of these tongue positions while you perform the movement reduces your dizziness.
- If the retest results are bad, start with the other vestibular drills, and try this exercise again after three to four weeks of training.



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2



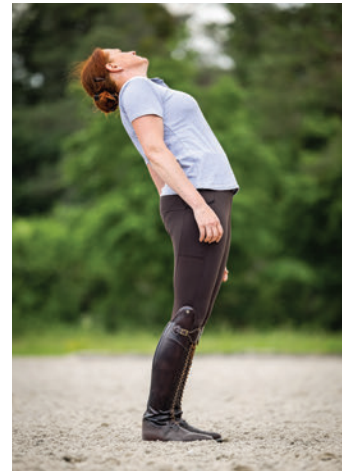
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- 1–3 Start with your feet shoulder-width apart, head and shoulders forward, and pelvis back, and then move the pelvis to the right, and the head to the left.
- 4–6 Circle your head and shoulders, and circle your pelvis. Both body parts should always be at precisely opposite points on the circle.
- 7 Let your arms relax and hang down. Do this exercise very carefully, starting in “slow motion” (see p. 42).



Giant Wheel: Start with your feet shoulder-width apart.



Keep looking at the weight.



Make the biggest circle you can.

GIANT WHEEL WITH GAZE STABILIZATION

This is a drill for stimulating the balance system and for strengthening the muscles of the upper body. You'll need a full 1.5-liter bottle of water, a small, lightweight kettlebell, or something else that you can hold easily with two hands and move in a circle. A 13-pound (6-kilogram) kettlebell is being used in the photographs.

Focus on: The biggest circle possible, while keeping your gaze fixed on the target.

How to do it:

- Try a test.
- Start in Neutral Standing Position. Begin upright, with your gaze fixed on the weight. Now start drawing the biggest circle you can in front of you in the air, with your arms stretched out and the weight in your hands. Your eyes should be fixed on the weight while you make the circle. Bring the weight to the left and then up above your head with your arms stretched out as far as possible, then down to the ground and back up again to

the right, and then over your head again—always keeping your gaze and focus on a point on the weight. Begin with three to five revolutions in each direction.

- Retest. Wait a short time for any dizziness to pass. Record the results in the table.

VESTIBULO-OCULAR REFLEX IN EIGHT DIRECTIONS

Focus on: Rapid head rotations with gaze fixing in the most difficult standing positions. You might be asking yourself why you need so many different test directions. It's quite simple: Each head movement activates precisely one canal in the inner ear and inhibits the opposite partner in the canal. It might be the case that only one of your total of six canals requires activation—this can help determine that.

How to do it:

- Try a test.
- Start in Neutral Standing Position. Focus



Feel free to stretch up and over yourself..



Now downward; keep focusing on the target.

on a visual target approximately an arm's length in front of your eyes.

- Do a lightning-fast semi-rotation of your head to the right, keeping your eyes firmly on the target.
- At the end of the half “no,” stop the movement, while still focusing on the target, and close your eyes. Count up to somewhere between 21 and 24 while bringing your head very slowly back to the center position with your eyes closed—very slowly, because otherwise you would activate the horizontal partner canal on the opposite side, and we want to achieve an isolated result for the right horizontal canal.
- Open your eyes again, immediately focus on the target, and start from the beginning.
- Do around five repetitions as described.
- Retest. Move on to the next canal. Record the results in the table.

TRAINING TIPS

- If our vestibular system doesn't do its job well, then we won't manage to keep our eyes on the target consistently, or see it clearly. You'll notice this because your target will become blurred during the



Back to the start, and continue.

drill, or your eyes will move away from the target with your head.

- Reduce the speed of the head movement and keep practicing. If you find you're frequently unable to keep your eyes on the target, then you can use your tongue. Try the half “no” (p. 76); also test your tongue pressure in the left or right cheek (p. 68).
- If that helps, do more of it; if not try high frequency vibration via bone conduction headphones. You can find more information about them online.

THE EIGHT HEAD MOVEMENT DIRECTIONS FOR FORWARD

Here's a brief description of the other head movements.

01 To the upper left	Rapid head movement with your nose to the upper left—half extension and rotation.
02 To the left	Rapid head movement with your nose to the left—half extension and rotation.
03 To the bottom left	Rapid head movement with your nose to the bottom left—flexion and rotation, as if you wanted to send your right ear to the floor.
04 To the upper right	Rapid head movement with your nose to the top right—half extension and rotation.
05 To the right	See drill description on pp. 132-133.
06 To the bottom right	Rapid head movement with your nose to the bottom right—flexion and rotation, as if you wanted to send your left ear to the floor.
07 To the top	Rapid head movement with your nose to the top—extension, as if you were going to take a hook to the chin.
08 To the bottom	Rapid head movement with your nose to the bottom—flexion, as if you were a bull and wanted to move your horns into an attack position.



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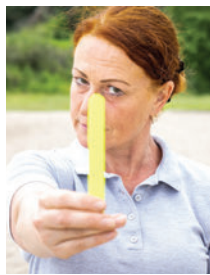
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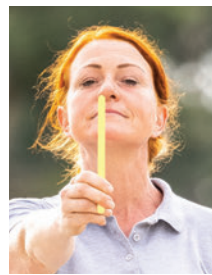
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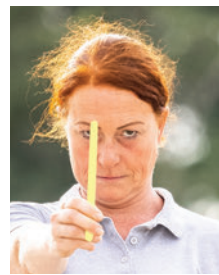
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