Take a Deep Breath and Your Heart Will Thank You

Breathing 101: Calm your nervous system, decrease pain and soothe anxieties

by Naomi Wolfman, GNC(C), NCA, BScN

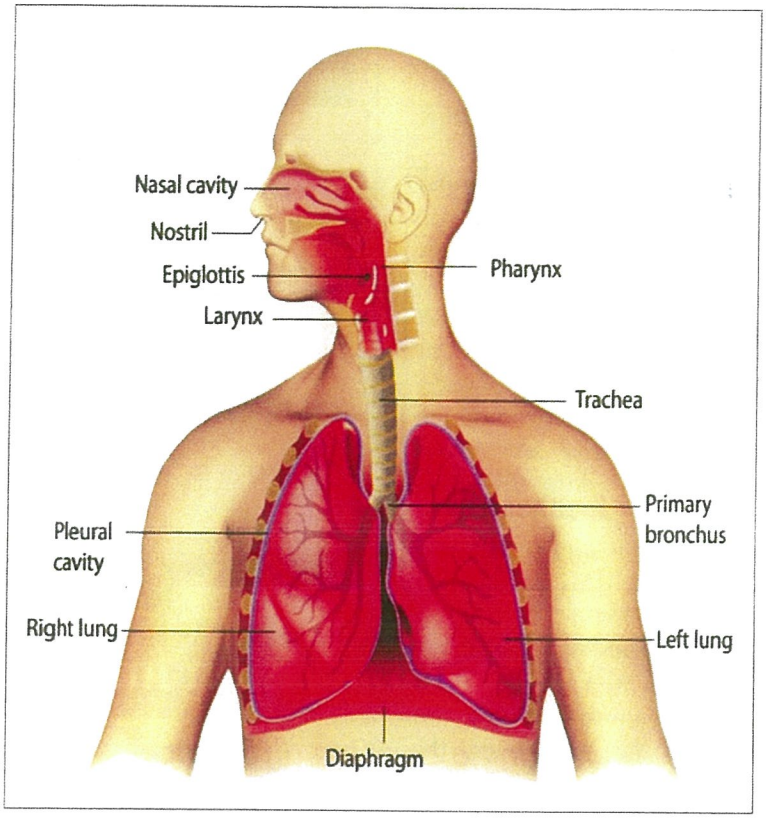
Breathing is the most important function of our existence. Have you ever wondered what trajectory our breathing takes or what highlights are there along the way? Have you ever wondered how the very air we breathe affects our body?

The O2 journey

When we breathe we take in oxygen (O2), which goes to our lungs and increases oxygenation in our blood. Blood flows in one direction, just like a mountain spring, through valves that open one way only. From the lungs and through the pulmonary veins, oxygenated blood goes into the left side of the heart, filling up the left atrium, which contracts and pulses our blood through the mitral valve to the left ventricle.

As the left ventricle fills up, it also contracts and pumps the oxygenated blood through the aortic valve into—you guessed it—the aorta. From here the aorta carries the blood toward our organs and tissues to be nourished. The aortic valve works hard and can fatigue in a lifetime; this is one of the reasons aortic-valve replacements give a new meaning to life.

At its destination, the blood deposits nourishment and takes away waste, bringing it together with the poorly oxygenated blood to the right side of the heart, through the vena cava and into the right atrium. Soon this chamber fills up, contracts and the blood continues its trajectory through the tricuspid valve to the right ventricle.



Numerous studies on meditation techniques recognize that breathing out relaxes and calms anxieties as well as decreases or alleviates pain.

The right ventricle shunts the poorly oxygenated blood through the pulmonary valve to the pulmonary artery. The blood then continues to the lungs to replenish oxygen, while the CO2 leaves our bodies through the out-breath.

What do we do next? Take another breath. And the rhythmic cycle starts once again.

The heart of the matter

None of this would be possible without the tireless, constant and reliable pumping of the heart. The heart is governed by electrical impulses that start at the sinoatrial node (SA node), located in the right atrium. The natural breathing pattern and heart rate go hand in hand. Our heart rate increases when we breathe in and decreases when we breathe out.

Numerous studies on meditation techniques recognize that breathing out (following breathing in) relaxes and calms anxieties as well as decreases or alleviates pain. This is when the "rest and digest" mode takes place, as the parasympathetic branch of the involuntary system is activated. As people, we are basically bipedal synergistic connections between the brain, body, breathing and circulatory system. This is a loving team at work: tireless, predictable, accurate and decisive.

What cues the heart rate?

Cueing the heart rate is one of the numerous functions our brain is responsible for performing nonstop, day and night. The centres that control our heart rate are located in the medulla oblongata, the lower part of the brain stem. One of these centres, namely nucleus ambiguus, increases the effect of the parasympathetic branch of the autonomic nervous system via the vagus nerve. According to the Institute for Applied Meditation, when we breathe in, the nucleus ambiguus receives inhibitory signals, the vagus

nerve remains unstimulated and our heart rate increases. Conversely, breathing out activates the nucleus ambiguus, stimulates the vagus nerve and decreases the heart rate.

This teeter-totter action also affects the electrical impulses to the SA node, which fires, setting the rhythm of our pulse. As the School of Medicine Cardiothoracic Surgery faculty at the University of Southern Califiornia reports, the SA node "is the natural pacemaker of the heart."

The right and left vagus nerves are the longest nerves in our bodies, spanning from the brain stem to the abdominal cavity and affecting our lungs, esophagus and viscera. Emotions we experience on a daily basis leave the landmarks encountered by the vagus nerve responsive, active and reactive.

Having optimal brain function gives you the comfort of welcoming life's ups and downs calmly and collected so you can make a safe, anxiety-free decision or response.

Which leads back to breathing. Whether we suffer with colon symptoms such as irritable bowel syndrome (IBS) or constipation or with fear of the unknown or panic attacks, conscious breathing can be employed as a catalyst to help resolve and alleviate these challenges. Breathing consciously is to breathe diaphragmatically.

Conscious breathing

In breathing diaphragmatically, also named respiratory sinus arrhythmia (RSA), we take about six breaths per minute. That is about 10 seconds per breath, divided into in-breath, out-breath and allocating for the short pauses in between breaths.

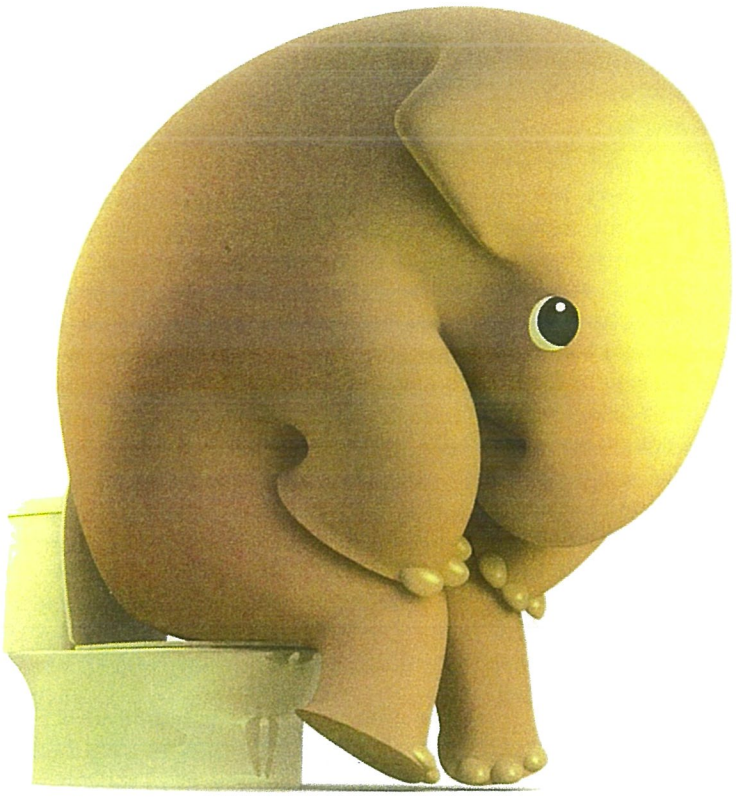
By conscious breathing, I mean taking in a full breath and visualizing the bottom, middle and top of your lungs fill with fresh, clean, oxygenated air. The middle diaphragm rounds and elongates towards the bottom and pushes onto the viscera, gently massaging the internal organs and, therefore, becoming a useful and welcome motion for regularity.

Further, the abdominal cavity pushes onto the pelvic floor, which needs to stay strong enough to receive this downward pressure. Just think when you have to sneeze or cough, sing or laugh. Especially when standing up with nothing to help support the pelvic floor, gravity taking over, that tremendous pressure can add bulge to, press and weaken the pelvic fibres. This is usually a sufficient reason for anyone wanting to increase his or her pelvic-floor strength.

On the out-breath you can visualize the air leaving the top, then the middle and then the bottom of the lungs and the reverse action happens: the diaphragm pushes out the rest of the air from the deepest pockets of your lungs, slowly, as in a sigh of relief. This action creates more room within your pelvic floor. If you are inclined to use the Kegel exercise for strengthening pelvic-floor muscles, you can commence the contraction on the out-breath.

As you can see, there is much more to breathing than meets the eye.

Naomi Wolfman, GNC(C), NCA, BScN, is a registered nurse specializing in continence. www.embrace-cs.ca | (604) 327-7056



Bladder Problems

Frank talk about a private problem

Do you:

- limit your social activities due to bladder problems?
- feel increasingly anxious about bladder accidents?
- always have skin rashes due to wetting or washing?
- have yet another bladder infection?
- get up more than twice a night to use the bathroom?
- use the bathroom more than eight times in 24 hours?

If you notice these symptoms, you may have a bladder control issue. They can signal a urinary infection, or an established urinary incontinence (lack of control).

Bladder control is something we take for granted. Once it becomes a problem, it can affect every aspect of your life. Fortunately, you can take action to improve it.

Urinary incontinence means that you cannot control when you lose or leak urine. The problem is more common than you might think. Nearly 10 per cent of Canadians have this issue – 20 per cent are men and 80 per cent are women. More people may experience these problems than statistics report.

Those who have problems with bladder control already know that it affects both confidence and daily activities. Extra clothing must be packed before an outing. Visiting an unfamiliar place may be out of the question because of concerns about bathroom access. Apart from the associated anxiety, the cost of laundry and pads can become a financial concern.

Incontinence is not a condition in itself. It signals an underlying issue. Something else is going on, and the body is signalling that it needs help.

If you have incontinence concerns, what can you do?

- Clear the air by understanding the myths and habits that surround incontinence.
- Believe that you are in the best possible position to learn, increase your awareness, and access your own body's resources.
- Address the subject with your family doctor.
- Make an appointment with a nurse continence advisor (NCA) or a pelvic floor physiotherapist.
- Bring up the subject with a health care provider rather than waiting for questions to be asked.
- Learn more about pelvic floor function. Resources are available at some community centre programs, in group talks or workshops on the subject, and in health magazines. Reputable websites are also a great source of information.

Make an appointment to discuss your problems. Your doctor will ask questions (take a history), do a physical examination, and have your urine tested (urinalysis). You may require other tests or procedures. Keeping a diary for a few days can provide a record of how much urine you pass, whether you have leakage, and how much fluid you have taken in. Adjustments to your lifestyle and diet may be recommended, along with exercises for your pelvic floor muscles.

If lifestyle and behaviour changes do not help, the next step is to involve a health care team consisting of many disciplines. This group of specialists can look deeper into the causes and correction of involuntary bladder spasms or at organs that are in unusual positions. Health care providers who explore, understand and treat the pelvic floor include gynecologists, nurse continence advisors, pelvic floor physiotherapists, urologists and urogynecologists, gastrointestinal and colorectal specialists.

Myths and habits that affect bladder control

Myths about incontinence have been around for a long time. Unraveling the truth behind your assumptions allows you to take charge and best support your own pelvic floor health.

Nothing can be done about incontinence. It is just part of aging.

No, age does not cause incontinence. It can be a factor, and can make symptoms worse. An older adult experiences some normal changes, including:

- smaller bladder capacity
- shifts in hormones
- lack of thirst
- less mobility, flexibility and muscle strength
- delayed bladder signals and responses.

It is a tall order to react to your body's signals, use the bathroom on time, and drink enough water, while staying mindful of chronic conditions.

Incontinence is not limited to older adults.

- In children, the urinary and genital systems are still developing. Up to 20 per cent of children over five years old still have issues with bladder control.
- A 2012 study showed that women aged 20 to 45 experienced an almost 40 per cent increase in stress urinary incontinence when doing high impact activity.
- Pregnancy and delivery play a role in urge urinary incontinence, even when a caesarean delivery is done.
- Ten years after being diagnosed with prostate cancer, 48 per cent of men under age 75 had at least one occurrence of urinary incontinence per day.

Strategy: Learn the facts about incontinence to prevent worsening symptoms, or avoid symptoms altogether.

Since I already have issues with bladder control, drinking more water will make it worse.

Contrary to popular belief, limiting the amount of water you drink will not solve incontinence problems. Instead, you risk dehydration. Dehydration creates bladder spasms, which are interpreted as urgency (needing to pee right away). You will make as many bathroom trips but pee smaller amounts.

Dehydration can also cause constipation. Large amount of stool in the bowel can push on the bladder, giving a signal of urgency. Certain fluids and foods that irritate the bladder also dehydrate the body. Caffeine and alcohol are good examples. Even decaffeinated tea has a small amount of caffeine. While alcohol may help you to fall asleep, it will not help with staying asleep. Drink healthy fluids, especially water.

Strategy: Unless your doctor advises you to restrict fluid, drink some water each hour during the day. Make water your first choice of fluid. Stop drinking a couple of hours before bedtime.

I put off visiting the bathroom until I get home, so I can avoid using a public toilet.

When waiting for over four hours to use the bathroom becomes a habit, the delay can stretch the bladder and damage the nerves to the tissues. This causes two problems. The urge to pee will not be felt as readily. As well, the bladder will not contract as effectively as it empties. Some urine will remain in the bladder, putting you at risk for urgency and recurrent urinary system infections. The bladder will also reach capacity much faster, leading to overflow incontinence.

Strategy: Answer the call of nature when it happens, about every three to four hours during the day.

I never touch the toilet seat.

Many people feel this way, especially girls in their twenties. However, hovering above the toilet to pee makes your pelvic muscles contract. This habit tenses, shortens, and weakens the very muscles you need to relax to pee effectively.

Strategy: Relax fully while on the toilet seat.

I cannot exercise those muscles.

Most people learn to use the toilet by age three or four, and believe that training should last the rest of their lives. No one even thought of exercising the pelvic floor muscles until the 1940s. Dr. Arnold Kegel, an obstetrician and gynecologist, recognized the advantages. He showed that when women who were pregnant or just had a baby contracted their pelvic floor muscles on a schedule, they toned these muscles. They had better bladder control and delivered their babies more easily.

Men who learn how to engage their pelvic floor muscles and do regular Kegel exercises have an easier time regaining continence after prostate-related surgery.

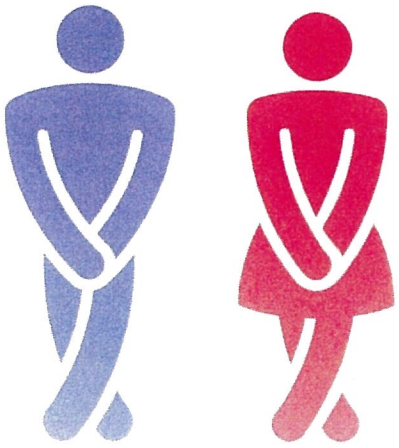
Strategy: Pelvic floor muscles can be toned, strengthened and relaxed, much as you would work any other muscle.

The best way to do pelvic floor muscle contractions is to stop peeing midstream.

Always stopping your urine stream to find the pelvic floor muscles or to do contractions can interfere with normal bladder nerve signals. If these signals are ineffective, urine may not be fully emptied from the bladder, resulting in urinary retention. Stopping the flow midstream should not become a regular habit.

Strategy: If you choose to find the muscles you use while you pee, be sure you only do it once in a while. This means once every four to six months only, just as a check.

Pay attention to your body and become aware of your daily habits. Social confidence, dignity, and an improved quality of life will be your reward.



photos © Maen CG, Alhovik/Shutterstock

I have to do 300 to 800 Kegel exercises each day.

Pelvic floor exercises are not a competition! When you first start doing the exercises, it is normal to tire easily.

Strategy: Doing 50 contractions each day is a good start.

About pelvic floor muscle exercises

The pelvic floor is a band of muscles between the pubic bone (at the front of your pelvis) and the coccyx (tailbone) in the back. For women, this band of muscles has three openings – the urethra, vaginal canal, and anal opening). Men have two, the urethra and anal opening. Continence depends largely on whether this band of muscles is toned. During a pelvic floor exercise, you contract these muscles.

To find these muscles, first empty your bladder. Lie down with your knees up. Practice contracting the back opening (anus) just as you would when you stop passing gas. Both men and women contract using the same muscles. When contractions are done correctly, men notice and feel a slight lift in the groin area. Women mostly need awareness to feel this action without a visual aid.

- Do 10 contractions at one time. Start by holding each contraction for three seconds. Progress every week until you can hold each one for 10 seconds. Relax fully after each contraction. Three times per day is a good start.
- Contract the pelvic floor muscles ten times quickly (one to two second contractions), relaxing fully after each contraction.

While doing these exercises, remember to breathe. Do not use any other muscles for the contraction. It is possible that you may feel tension or pain when contracting. This is a sign that your pelvic floor muscles need to be fully relaxed before doing any Kegel exercises.

We all are different, with unique tissue make-up and abilities. It takes about three to four months for a muscle fibre to grow, so be patient with yourself!

Changes you can make

- Learn how to do *and* practice pelvic floor exercises.
- If you have problems finding the right muscles, a pelvic floor biofeedback specialist may be able to help.
- Learn good bladder habits. Establish a goal to pee up to eight times in 24 hours. Relax your muscles when you are sitting on the toilet seat.
- Prevent constipation. Eat a variety of soluble and insoluble fibre, along with drinking water.
- If you consume food or drink that irritates your bladder, change your diet. Include water as a first choice of fluid.
- Walk at least 20 minutes per day.

Continence is like a finished puzzle. Each puzzle piece can help prevent or reduce symptoms. Place the pieces in the right spot, review the puzzle daily, clear the space around it, and focus on what other connections are possible. You will make steady progress, and enjoy the process and the finished picture in no time.

As you strive for continence, you focus on your own resources. Pay attention to your body and become aware of your daily habits. Social confidence, dignity, and an improved quality of life will be your reward.

WRITTEN BY: ***Naomi Wolfman**, GNC(C), NCA, BScN, is a registered nurse holding post-graduate specialities as a Nurse Continence Advisor and in Gerontology Nursing. She is the founder of Embrace Continence Solutions Ltd. (www.embrace-cs.ca) which focuses on prevention and treatment of incontinence.*

Causes of incontinence

Symptoms of urine loss develop for different reasons. They include:

- weak pelvic floor muscles
- pregnancy and childbirth
- hormones
- constipation
- infections of the lower urinary system
- age
- chronic cough
- chronic conditions (stroke, Parkinson's disease, multiple sclerosis, cerebral palsy, spinal cord injury, Shy-Drager Syndrome)
- obstruction of the urethra (the tube that empties the bladder to the outside of the body)
- prostate enlargement (men)
- organs in the pelvis that have moved lower (descended)
- radiation treatment
- extra weight in the abdomen area
- some medications
- some surgeries
- some foods and fluids (caffeine, alcohol, spicy foods, tomato products, aspartame, and fizzy drinks).

Types of incontinence

- ***Stress incontinence*** – loss of urine during an activity that puts pressure on the bladder, such as sneezing, coughing, exercising or lifting a heavy object.
- ***Urge incontinence*** – an urge to pee that cannot be ignored, followed by a loss of urine.
- ***Mixed incontinence*** – a combination of stress and urge incontinence.
- ***Overflow incontinence*** – the bladder is not emptying fully, so small amounts of urine leak out.
- ***Functional incontinence*** – difficulty getting to the bathroom in time, resulting in urine loss. Functional incontinence may happen because of lack of mobility or barriers in the environment, including trouble walking, challenges undoing buttons on clothing, or a toilet that is difficult to access.

For more information

The Canadian Continence Foundation: ***www.canadiancontinence.ca***
Canadian Nurse Continence Advisors Association: ***www.cnca.ca*** (search under Patient Education)