



# HYDRATION AND GOLF

BLUEWATER HYDRATION is a water intelligence series to spark consumer awareness about the importance of staying well hydrated at work, rest and play



## Playing it safe: Staying properly hydrated to help prevent and treat golf injuries

Over 60 million women, men, and children on six continents play golf regularly. But although played for hundreds of years, the latest sports science says modern golf is taking a toll on players with more powerful swings sparking traumatic injuries.

A 2019 study by three spine surgeons, published in the Journal of Neural Surgery, says back disorders are the most common golfing injury, accounting for 55% and 35% of injuries among professional and amateur golfers.

The study, authored by Corey T. Walker, MD, Juan S. Aribe, MD, and Randall W. Porter, MD, all from the Barron Neurological Institute, St. Joseph's Hospital and Medical Center, Phoenix, Arizona, additionally said an increasing number of young professional golfers are experiencing low-back pain and degenerative disc disease at 'ages much younger than those of the general adult population'.

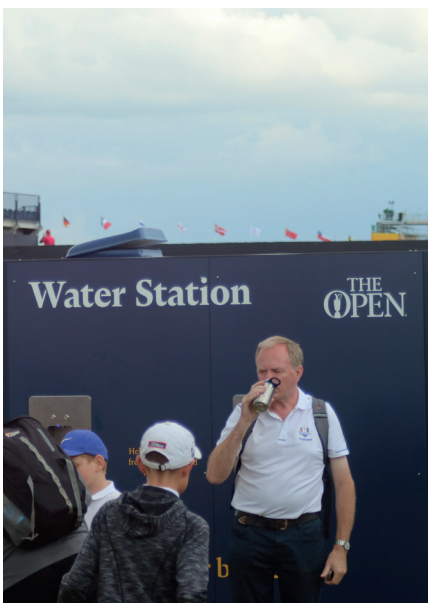
The authors put the blame for the increasing cases of lower-back injury on modern swing techniques. They said this is placing extraordinary loading and torsional stress forces on the lumbar

spine. With around 300 swings per golf-playing day, a golfer repeatedly experiences minor traumatic injuries to the spine, according to the spine surgeons. They believe this can result over time in a pathogenic process termed "repetitive traumatic discopathy" (RTD).

American sports medicine specialist Dr. Angie Mueller believes golfers can take pro-active steps to avoid back injury. She told Bluewater that a prime focus for every golfer should be to stay adequately hydrated to ensure optimal water flow to muscles, joints, and spine.

### Hydrating with water is pro-active

The water volume in the spinal discs supports most of the weight of the upper body. Therefore, proper hydration is a preventative measure against back pain that can result from golf swing mechanics.



Golf fans hydrate at a Bluewater water station during the prestigious 2019 The Open golf tournament in Portrush, Northern Ireland

Dr. Mueller, who holds a Doctorate in Physical Therapy from Regis University and a Bachelor's in Health and Exercise Science with a concentration in Sports Medicine from Colorado State University, recommends professional and amateur golfers drink water before, during and after the game. This should happen regardless of the time of year or weather conditions.

"Proper hydration is critical for physical performance as well as mental clarity and endurance while playing a round of golf," she says.

One of golf's top advisory bodies, the European Tour Performance Institute (ETPI), endorses Dr. Mueller's viewpoint. Using the knowledge amassed by the Tour's performance and medical practitioners over the past 20 years, ETPI says there is sound evidence that the timing of hydration before and during sustained exercise will significantly improve performance.

The ETPI notes that research has additionally shown that "even mild dehydration (1-2% of body mass) may significantly impair cognitive-motor task performance".

#### **Differing advice clouds understanding**

A major problem for professional and amateur alike golf players – as well as

other consumers – is that the advice about how much water to drink is often contradictory.

The European Hydration Institute says consumers are often misinformed and confused about the advice they get as a result of the fragmented information. The EHI stresses that water needs vary enormously among individuals. This means that individualization of advice is essential to meet the body's water requirement<sub>1</sub>.

#### **Top athletes also confused about hydration**

Even professional sportspeople are uncertain about how to stay well hydrated. A Spanish study, conducted by researchers from the Universidad de Castilla la Mancha (UCLM), revealed 91 percent of professional basketball, volleyball, handball, and football players were dehydrated even before starting their training sessions and often relied on feelings of 'thirst' to tell them when to hydrate<sub>2</sub>.

Mats Rundgren, a former senior lecturer and researcher at the Department of Physiology and Pharmacology at Sweden's Karolinska Institute, does not believe thirst is the best measure of how much you should drink.

He told Medical Science Magazine that "thirst is a powerful driving force when you are really suffering from a water

shortage, but studies have shown that we are rarely thirsty for purely physiological reasons"<sub>3</sub>.

Rundgren says people tend to ignore the sensation of thirst, particularly during sports, when the focus is on performing instead. He stressed that the thirst craving comes when the shortage of liquid is so significant that it has already had an impact on performance.

Dr. Mueller recommends daily hydration rituals that are independent of thirst to all her patients. She believes it is best to make hydration part of your daily lifestyle instead of trying to "pre-hydrate" a few hours before the sport because the body cannot store excess water.

#### **Dehydration impairs the brain**

A 2018 American study at the University of Georgia, published in *Medicine & Science in Sports & Exercise Journal*, found that cognitive functions fade as water leaves the body.

After analyzing data from multiple peer-reviewed research papers on dehydration and cognitive ability, the study concluded 'functions like attention, coordination and complex problem solving' suffered the most from dehydration – not great news for golfers approaching a green.



#### **The spine**

The spine is an impressive part of the human body. It protects the spinal cord and is the body's central support structure, helping to keep us upright, to bend and twist, and connecting the various parts of the skeleton.

The spine is made up of 33 different, interlocked bones known as vertebrae stacked on top of one another as well as muscles, tendons, ligaments, nerves and vascular structures like arteries and veins. The ligaments are like durable, fibrous bands that hold the vertebrae together.

The spine of an adult has a natural S-shape which works like a coiled spring to absorb shock, maintain balance, and aid a range of motion. The abdominal and back muscles support the spine and maintain its natural curve. When this natural curve is lost due to posture, weakness or injury, back pain commonly occurs and sports performance is negatively impacted.

#### **The lower back**

The lumbar spine or "lower back" is where almost all human movement begins. It is situated between the rib cage and the pelvis. The lower back contains large muscles that support this back and allow for movement of the trunk of the body.

As a golfer, your back is one of the more vulnerable areas when it comes to joint pain. The last two lumbar joints L4-L5 and L5-S1 carry the most weight of any other joints in the spine - and have the most motion - making the area very prone to injury.

Bending and swinging can sprain ligaments, strain muscles, rupture disks, and irritate joints, all of which can lead to back pain. Even the simplest of movements— such as picking up a golf ball on the green or hitting a solid root in the rough — can have painful results.



### Interesting facts about back pain

Worldwide, back pain is the single leading cause of disability, preventing many people from engaging in work as well as other everyday activities

- Experts estimate that up to 80% of the population will experience back pain at some time in their lives
- Back pain can affect people of all ages, from adolescents to the elderly
- Most cases of back pain are mechanical or non-organic — meaning they are not caused by severe conditions, such as inflammatory arthritis, fracture or cancer
- Most people with low back pain recover; however, reoccurrence is frequent
- Low-back pain is expensive for society. Studies have shown it costs Americans at least US\$50 billion in annual health care costs

- Source: <https://www.acatoday.org/Patients/Health-Wellness-Information/Back-Pain-Facts-and-statistics>

Golf professionals hydrate using a Bluewater stainless steel bottle at The 148th Open. The prestigious championship was played at Royal Portrush, Northern Ireland, in July 2019.



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## Okay, but how much water should you drink?

**The evidence indicates that a low intake of water or even mild dehydration may lead to an increased risk of chronic disease and reduced brain performance. But, apart from agreeing that everyone needs to drink several liters of water every day to stay healthy, health experts appear unable to agree on just how much water we should be drinking and how often.**

A 2015 water intake study<sup>4</sup> published in the European Journal of Nutrition by Joan Gandy of the School of Life and Medical Services, University of Hertfordshire, in the U.K., noted how the European Food Safety Authority (EFSA) and the U.S. Institute of Medicine (IOM) both published gender and age-specific recommendations on water intake. However, the two organizations took different approaches in determining recommendations, which resulted in a disparity in what was recommended as daily water intake. For example, the Europeans advised that men should have a total daily water intake (from both fluids and food) of 2.5 liters a day, while the Americans advised 3.3 liters.

### Still confused?

We asked Dr. Mueller to summarize her own conclusions (please, always speak to your medical doctor to get drinking water advice specific to you as an

individual): “Individual water intake depends on several factors: body weight, how much you sweat, the climate you live in, how often you exercise, and whether you consume other foods or beverages that dehydrate you (like alcohol, coffee, and soda)”, Dr. Mueller told us

Dr. Mueller’s calculations are based on her patient’s body weight. She recommends that patients drink half of their body weight (if measuring in pounds) in ounces of water. If you measure your body weight in kg, you need equal ounces of water. She adds 10-20 ounces for living in a hot, humid climate. She adds 10 ounces of water per 10 minutes of sweating the person experiences. She also adds 10 ounces of water per dehydrating beverage her patients consume.

### So what does this tell golfers?

A golfer’s optimal water intake is truly individual. But the evidence seems to say you should drink around a 500ml (16 fl. oz.) water before you start playing a round. Then keep sipping on the course from a 1-liter bottle (32 fl. oz), because drinking from a larger container will make you drink more. And once you finish the round, make sure to drink at least another liter of water.



### Tips to Prevent Back Pain

Here are several simple strategies we've culled from multiple sources. Among them:

- Maintain a healthy diet and weight
- Implement hydration rituals into your lifestyle, like carrying a water-bottle everywhere that you can sip from to ensure your body maintains a hydrated state, even when playing golf.
- Hydrate properly before, during and after the round of golf not just when you feel thirsty
- Avoid prolonged inactivity or bed rest.
- Warm up or stretch before exercising or physical activities, such as playing golf
- Maintain proper posture throughout your daily life.
- Wear comfortable, low-heeled shoes.
- Sleep on a mattress of medium-high firmness to optimize the curve in your spine.
- When lifting an object, even a light one like a golf ball, bend at your hips and knees, keep the object close to your body, and do not twist.
- Keep your core muscles strong with regular breathing and postural exercises.
- Maintain flexibility in your hips and shoulders so that your spine doesn't have to twist as much when you swing the golf club.

### Sources:

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### About Bluewater

Bluewater is a world leader innovating, manufacturing, and commercializing water purification technologies and solutions for residential, business and public use. Bluewater harnesses patented, second-generation reverse osmosis technology to remove pollutants from water, including lead, bacteria, pesticides, medical residues, chlorine, microplastic particles and limescale.

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