

## DERMATOLOGICAL CONCERNS

*Managing rashes, chafing, bruising and skin bends.*



*Suit squeeze bruising, Image source: (Mutluoglu 2012)*

There are many causes of diving-related skin conditions. Seals (particularly those made of latex) can irritate the skin; if you have sensitive skin, you should use seals made of silicone or neoprene or gel-type seals. An ill-fitting suit may result in chafing; barrier creams can help protect your skin at points

of contact with your suit. You may also see bruising due to a problem called drysuit squeeze, which is caused by a failure to add air to your suit during descent; this occurs most often beneath valves and seams.

Rashes, chafing or bruises are sometimes confused with other diving-related skin conditions, most notably skin bends. Skin bends, caused by a mild form of DCS, is a blotchy, bruise-like rash that usually occurs on the areas of the body with the most adipose tissue, such as the abdomen, thighs, buttocks and breasts. Skin bends is frequently accompanied by deep-tissue soreness or tenderness and sometimes by neurological symptoms, such as fatigue, dizziness, blurred vision or memory impairment. The mechanisms of skin bends are not clearly understood and there are no accurate predictors of a given individual's susceptibility to the condition.



Early recognition of skin bends symptoms is important. If you have recently been diving and observe any skin lesions, you should seek prompt evaluation from a physician trained in dive-related medicine so you can be screened for neurological symptoms and get an accurate diagnosis.

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Approximately 20% of divers who experience skin bends develop accompanying neurological symptoms.



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HEALTH & DIVING REFERENCE SERIES

# MEDICAL CONSIDERATIONS FOR DRYSUIT DIVERS



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## CONSTRICTION CONCERNS

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### *Preventing hand numbness and carotid sinus reflex.*

The seals around your neck and wrists should fit snugly, without being too tight. Wrist seals that are too tight can cause pain in your fingers and hands, which can lead to numbness, tingling or loss of dexterity and an increased susceptibility to cold injury. Neck seals that are too tight can cause a condition called carotid sinus reflex, which results in a slowing of your heartbeat and the flow of blood to your brain; this can make you feel dizzy or lightheaded and even cause you to lose consciousness. Appropriate trimming and stretching your seals before use will help prevent overconstriction.

## UROLOGICAL CONCERNS

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### *Dealing with complications of a P-valve system.*

Urination while wearing a drysuit can be facilitated by a P-valve system, which includes a sex-specific collection device that you put on before donning your drysuit and a tube that conducts urine out into the surrounding water. However, such systems involve a risk of complications, such as pneumaturia (the passage of air during urination), urogenital infections, or a condition known as genital squeeze or catheter squeeze.

Pneumaturia occurs when air or gas passes into the urethra before or after urination. Urogenital infections are often caused by inadequate cleaning of P-valve tubing, so thorough postdive hygiene, including disinfection of your P-valve system after each use, will minimize such complications; the use of a balanced P-valve system, with one-way check valves, also helps prevent infections. In addition, a balanced P-valve system helps prevent genital squeeze, which is caused by a depth-related drop in the capacity of an unbalanced system's tubing.



## BUOYANCY CONCERNS

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### *Handling weighting, inversion, inflation and suit flooding.*

Proper weighting will improve your buoyancy, so your drysuit will require only minimal addition or venting of air. You should use your suit itself for primary buoyancy control, rather than a buoyancy compensating device (BCD). Your suit will need adjustment in any case, and having only one source of buoyancy will reduce the number of tasks you need to focus on, particularly during ascent. However, you should still wear a BCD—both as a flotation aid after you surface and as a backup in case of a buoyancy failure in your suit.

Other drysuit problems, though rare, can cause positive buoyancy and uncontrolled ascent. For example, inversion is caused by an accumulation of gas in the legs of your suit. This is best prevented with proper weighting, but elastic straps or gaiters will also minimize the migration of gas to your legs. Problematic overinflation can occur if your suit's inflator valve becomes stuck in the open position. This can be remedied by using your dump valves to neutralize the air flow, or by detaching the inflator hose if necessary.

If you experience buoyancy problems and cannot correct them, you should flare your body to slow your ascent and control your breathing. This will help to minimize the likelihood of barotrauma.

If your drysuit floods with water, it's rarely an emergency, unless you're diving in contaminated waters. Suit flooding can be caused by a blown neck seal or catastrophic damage to the suit. If your suit floods, you should end your dive safely, using your BCD for buoyancy as appropriate.



## THERMAL CONCERNS

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### *Proper use of insulated and electrically heated garments.*

If you plan to wear a drysuit, it is important to use appropriate insulation to protect yourself from cold underwater conditions. Effective thermal protection requires three garment layers: a base layer, an insulating layer and a shell. The function of each layer is as follows:

- + The base layer (typically made of polyester or polypropylene) wicks moisture away from your skin to prevent heat loss through conduction.
- + The insulating layer (merino wool, microfiber, fleece, or other materials) traps and holds heat to reduce heat loss through conduction.
- + The shell (membrane, neoprene or a hybrid) holds in air to further reduce conductive and convective heat loss.

You should adjust your thermal protection according to the type of dive you intend to undertake. Factors to consider in choosing the weight of your insulating layer include the temperature of the water, your personal metabolism and your anticipated activity level.

Some divers choose to wear electrically heated garments for added thermal protection. Such garments may enhance your underwater comfort; but, if not used properly, they can increase your risk of decompression sickness (DCS). To minimize decompression stress, leave heated garments off or at the lowest setting during the descent and bottom phase to minimize the increase in inert gas uptake, then increase the setting modestly for the ascent and stop phase to encourage inert gas elimination without excessive promotion of localized overheating that can promote bubble formation and skin symptoms.