

# Decompression Illness (DCI)

Scuba diving has become a very popular sport with literally hundreds of thousands of people taking diving vacations. Because most of these divers fly to their destination and return home by air, the relationship between flying and diving must be appreciated.

The issue is the risk of developing DCI if a traveler flies too soon after diving. DCI is caused by excess nitrogen coming out of solution in the form of microbubbles in different tissues. This is facilitated by exposure to low barometric pressure (flying) too soon after exposure to high barometric pressure (diving) and could result in bends (joint/muscle pain), or more serious sequelae such as pulmonary chokes, neurological dysfunction, or neurocirculatory collapse.

In reality, DCI can occur in any diver (even without postdive flying), particularly if dive table recommendations are not adhered to. (These tables describe proper procedures for resurfacing.)

When is it safe to fly after diving? A precise answer is difficult because there are few scientific data on the subject (1). There are, however, some ongoing specific studies at the Hyperbaric Center at Duke University Medical Center. In addition, Divers Alert Network (DAN) has issued the following flying-after-diving guidelines based on the findings of the Undersea and Hyperbaric Medical Society (UHMS) 1991 Conference (2,3,4).

1. Divers making single dives per diving day should have a minimum surface interval of 12 hours before ascending to altitude. This includes going to altitude by aircraft, automobile, or any other means.
2. Divers who make multiple dives per day, or over many days, or dives that require obligated decompression stops should take special precautions and wait for an extended surface interval beyond 12 hours before ascending to altitude. Extended surface intervals allow for additional denitrogenation and may reduce the likelihood of developing symptoms. For those diving heavily during an extended vacation, it is advisable to take a day off at midweek, or save the last day to buy those last-minute souvenirs before taking to the air.

There can never be a rule that guarantees the prevention of DCI, no matter how long the surface interval. Rather, research has produced guidelines that represent the best estimate for the majority of divers for a conservative, preflight surface interval. There will always be an occasional diver whose physiological makeup or unique diving circumstances will result in DCI despite adherence to general guidelines.

Until there are more data from the ongoing research, these are the best recommendations that physicians can give travelers who plan to dive and fly. In preparing travelers for a diving vacation, the recommendation to leave the last day dive-free should be emphasized.

Finally, these guidelines assume that there are no signs and/or symptoms of DCI after the dive and before the flight. If there are, flying is contraindicated before appropriate treatment (recompression) is carried out.

## REFERENCES:

1. Vann RD, Denoble P, Emmerman MN, Corson KS. Flying after diving and decompression sickness. *Aviat Space Environ Med* 1993; 64:801-7.
2. Anon. *Alert Diver*. 1994; May-June: 12-3,20-3.
3. Bennett PB. DAN resolution of flying after diving guidelines. *Alert Diver*. 1991; Sept/Oct.
4. Gleason B. SDM editorial. Flying after diving again. *Skin Diver*. Sept 1991.