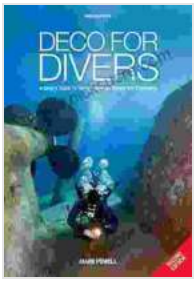
A Comprehensive Guide to Decompression Theory and Physiology for Divers

Decompression theory is a branch of diving science that deals with the effects of pressure on the human body. It is important for divers to understand decompression theory in order to safely plan and execute dives.

When a diver descends underwater, the pressure of the water increases. This increased pressure compresses the diver's body tissues, including the lungs, heart, and brain. The diver's body also absorbs nitrogen from the compressed air. Nitrogen is a gas that dissolves in body tissues, and it can cause decompression sickness (DCS) if it is not properly released.

DCS occurs when nitrogen bubbles form in the body tissues. These bubbles can block blood flow, causing pain, paralysis, and even death. DCS can be prevented by following decompression theory, which provides guidelines for divers on how to safely ascend to the surface after a dive.



Deco for Divers: A Diver's Guide to Decompression Theory and Physiology by Mark Powell

4.7 out of 5

Language	: English
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Screen Reader	: Supported
Enhanced typesetting	: Enabled
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Decompression theory is based on the principle of Boyle's Law, which states that the volume of a gas is inversely proportional to the pressure of the gas. This means that as a diver ascends to the surface, the pressure decreases and the nitrogen that has been dissolved in the body tissues will expand.

If the diver ascends too quickly, the nitrogen bubbles will form in the body tissues and DCS can occur. To prevent DCS, divers must ascend slowly and allow the nitrogen to be released gradually.

There are a number of different decompression models that have been developed to help divers plan and execute safe dives. The most common decompression model is the Bühlmann decompression model, which is used by most dive computers.

The physiology of decompression is complex and involves a number of different factors, including:

- **The rate of ascent:** The faster a diver ascends, the greater the risk of DCS.
- **The depth of the dive:** The deeper a diver dives, the more nitrogen will be dissolved in the body tissues and the greater the risk of DCS.
- **The duration of the dive:** The longer a diver stays at depth, the more nitrogen will be dissolved in the body tissues and the greater the risk of DCS.

- **The diver's age:** Older divers are at greater risk of DCS than younger divers.
- **The diver's fitness:** Overweight and unfit divers are at greater risk of DCS than lean and fit divers.

The best way to prevent DCS is to follow decompression theory and practice safe diving habits. Here are some tips for preventing DCS:

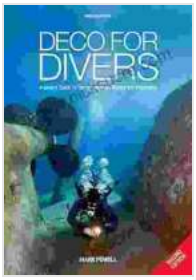
- **Plan your dives carefully.** Use a dive computer or dive table to determine the safe ascent rate and depth for your dive.
- **Ascend slowly.** Don't rush to the surface. Take your time and allow the nitrogen to be released gradually.
- **Make safety stops.** During your ascent, make safety stops at depths of 10-15 feet for 3-5 minutes each. This will help to reduce the risk of DCS.
- **Hydrate yourself.** Drink plenty of fluids before, during, and after your dive. This will help to flush nitrogen out of your body.
- **Avoid alcohol and caffeine.** Alcohol and caffeine can dehydrate you and increase your risk of DCS.

Decompression theory is a complex but important topic for divers to understand. By following decompression theory and practicing safe diving habits, you can help to prevent DCS and enjoy safe and fun dives.

Image Alt Attributes

- **Diver with decompression gauge:** Close-up of a diver checking their decompression gauge at depth.

- **Bubble formation in body tissues:** Illustration of nitrogen bubbles forming in the body tissues of a diver.
- **Decompression chamber:** Inside view of a decompression chamber, showing a diver being treated for decompression sickness.
- **Dive computer:** A dive computer, which is used to monitor depth, time, and decompression information.
- **Decompression table:** A decompression table, which is used to determine the safe ascent rate and depth for a dive.



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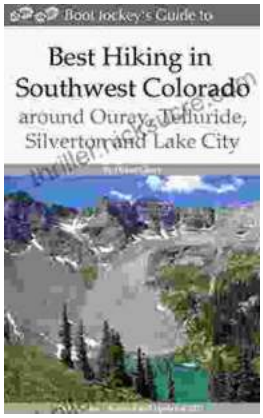

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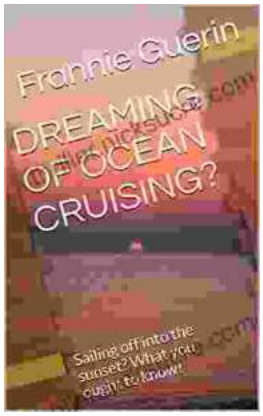

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