



FIGURE 3.11
The Relationship of Physiological Effects in Carbon Dioxide Concentration and Exposure Periods

Zone IV: Marked physical distress, dizziness, stupor, inability to take steps for self-preservation.

Zone V: Unconsciousness. Above a CO₂ partial pressure (PCO₂) of 0.15 ata, muscle spasms, rigidity, and death can occur. The bar graph at the right of Figure 3.11 extends the period of exposure to 40 days.

Zone A: Concentrations between 0.5 and 3.0% (0.005-0.03 ata partial pressure), no biochemical or other effects.

Zone B: Above 3% (0.03 ata partial pressure). Adaptive biochemical changes, which may be considered a mild physiological strain.

Zone C: Pathological changes in basic physiological functions. For normal diving operations, ventilation rates should be maintained so that carbon dioxide partial pressures are maintained in Zones I and II for short-term exposures and in Zones A and B for long-term exposures.

Treatment:

Divers who are aware that they are experiencing carbon dioxide buildup should stop, rest, breathe deeply, and ventilate themselves and their apparatus. Fresh breathing gas usually relieves all symptoms quickly, although any

headache caused by the buildup may persist even after surfacing. If a diver becomes unconscious, he should be treated in accordance with the procedure described in Chapter 21.

3.2.6.3 Hyperventilation

Hyperventilation includes several conditions that

Should Read as Follows:

Zone A: Concentrations between 0.0 and 0.5% (0.000-0.005 ata partial pressure), no biochemical or other effects.

Zone B: Concentrations between 0.5 and 3% (0.005-0.03 ata partial pressure). Adaptive biochemical changes, which may be considered a mild physiological strain.

Without enough CO₂, normal, needed carbonic acid levels are not achieved, pushing body chemistry to the alkaline. The resulting alkalosis initially produces tingling fingers and limbs and lightheadedness. Over a longer period, it may produce weakness, faintness, headache, and blurred vision.

Slowing breathing will correct this, but divers may not be aware of why symptoms are occurring and not take corrective measures.

Divers who notice that they are excessively hyperventilating should take immediate steps to slow their breathing