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From: sbharris@ix.netcom.com (Steve Harris sbharris@ROMAN9.netcom.com)  
 Newsgroups: sci.chem,sci.med  
 Subject: Re: Nitrogen KILLS  
 Date: 7 Oct 2004 11:00:48 -0700  
 Message-ID: <79cf0a8.0410071000.75787115@posting.google.com>

"hanson" <hanson@quick.net> wrote in message  
 news:<6k19d.4624\$UP1.124@newsread1.news.pas.earthlink.net>...

> However, there seems to be something still elusive and not  
 > mentioned yet for that stated "**quick death**" **quality ascribed to N2.**  
 >  
 > **For instance sudden cabin pressure loss at 30'000+ ft results**  
 > **in unconsciousness so fast that the pilots can't even relay what**  
 > happened.  
 > OTOH mountaineers like the Austrians Messner & Habeler have  
 > **climbed the ~ 30'000 ft Mt. Everest twice without any O2 gear.**  
 >  
 > Maybe some posters in sci.med. can shed light onto this.  
 > The thread started in sci.chem.  
 > hanson

COMMENT:

There's nothing too strange about any of this, if you remember only that your lungs are a wonderful gas exchanger, and they work totally passively-- ie, they work just as well to clean oxygen OUT of the blood, if you breathe nitrogen or "breathe" vacuum or low pressure air. So in neither instance do you get nearly the time you do from holding your breath. Of course, if your cabin depressurizes, you CAN'T hold your breath.

**You have enough oxygen in your brain tissue to support consciousness for about 5 seconds. If your blood pressure goes to zero (ie, your head is cut off) you get that 5 seconds and about 5 more (the oxygen in your brain capillaries) and then it's light's out. If your merely heart stops, you get another 5 seconds on top of this from diasolic flow, but after 15 seconds total, it's still lights out.**

If you decompress, the blood passing through your lungs is instantly deoxygenated, and your consciousness time is the time it takes that blood to reach your brain. Maybe 20 seconds. A bit longer if you're not in total vacuum, but **rather only in an airplane at 30,000 feet (not vacuum but 0.3 atm).**

If you breathe nitrogen, **you would in theory get 20 seconds after your lungs were pretty much deoxygenated (ie, down to 30% of normal oxygen content). BUT it takes some breaths to do that, since your functional residual lung capacity (what's in your lungs at the end of a normal expiration) is 4 or 5 times your "tidal volume" (what you breathe in a normal breath). So if you take your oxygen level down (say) 20% with each breath, your oxygen is  $(0.8)^5 = .32 = 32\%$  of normal after 5 breaths, so at 5 seconds a breath it takes 25 seconds to get you functionally to the top of Everest or a cockpit at 28,000 ft.** Add a few more seconds for circulation time to the head, and 40 seconds total

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is a fair estimate for how long to pass out. Faster, of course, if you huff and puff.

I've seen suggestions that nitrogen should be used in gas chambers for a much more humane execution than happens with stinky and chokey hydrogen cyanide. Nitrogen's odorless, and there's very little feeling of hypoxia when you breathe it. You just pass out, which is what makes it so dangerous. And with nitrogen you could use the old equipment, but dispense with most of the time and effort associated with handling cyanide gas and keeping it away from everybody but the condemned. Unfortunately, cyanide is historically what we started with, and it's hard to change habit.

A final thought: somebody suggested that nitrogen might have narcotic effects that nobody notices even at normal pressures, since we've adapted to them. But there is no evidence for this. People breathing pure oxygen or oxy-helium don't suddenly become smarter or more hyped up. They don't notice any difference at all.

The narcotic effects of nitrogen in diving start to become apparent at about 4 atm absolute, or 5 times what's normally breathed at sea level. And are mild, even then. Many divers can still operate at 6 or even at 7 times normal pressure, though it's not recommended. The world record for deep scuba air diving is around 12 or 13 times normal pressure, though it's killed many a diver trying for lower, so I think recording of that as a record has been suspended.

SBH

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