Aging and Altitude

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IF YOU’RE INTO MOUNTAINS AND MOUNTAIN SPORTS, some day you will wonder how much longer you can ski, climb and trek on the mountains you love. Some exceptional men and women do strenuous sports well into their seventies, but what about altitude? The oxygen available in air decreases as you go higher; how will this affect you as you grow older?

A continuous supply of oxygen is essential to our lives; we neither store nor make it in our bodies. An elegant set of functions maintains the constancy of this supply. We breathe to move air in and out. Oxygen diffuses from the lungs into the blood. The heart pumps blood throughout the body, carrying oxygen loosely bound to red blood cells. Every living cell receives a supply from small tissue capillaries. Waste carbon dioxide moves in the opposite direction. It’s a beautifully tuned transport system, designed to keep us functioning well despite a wide range of circumstances.

But as we age, most of our functions deteriorate, and few improve. Each part of the oxygen transport system is affected. We don’t breathe quite as well, our lungs are a bit stiffer and oxygen doesn’t pass as readily from air to blood. Our heart can’t beat as fast, or as hard, and often its muscle doesn’t receive enough blood due to narrowed arteries. The cells may also go hungry because small blood vessels are clogged with arteriosclerosis. Muscles wither and weaken. The brain may not get all the oxygen needed for complex decisions and judgment suffers, along with memory and reflexes. Of course, some people age early, and some age late, but for all of us there comes a time when we simply cannot do everything we wish.

There’s some good news for mountain lovers. Two recent studies suggest that older men and women tolerate moderate altitude at least as well, and perhaps even better than the young. Old folks don’t seem to develop the symptoms of acute mountain sickness (AMS) as often or as severely, and they manage to hike and ski quite well—at least up to 9000 feet which is where many popular mountain resorts are located. This was suspected from a large study at six resorts, which showed that with every decade of aging, the incidence of AMS was slightly less.

More recent studies were done on some of the 1600 veterans of the Tenth Mountain Division who met for a reunion at 8500 feet in Colorado. Of those studied, half had some heart or lung problem, either arteriosclerosis with or without a heart attack or bypass, or high blood pressure, or bronchitis, or
emphysema. Yet, none showed bad effects due to the altitude, in either lung function or electrocardiogram which measures activity of the heart. In all of them, blood pressure did rise at first and then decreased toward normal, but neither those with high nor those with normal blood pressure at home had any ill effects. Half of the group were quite athletic, though their average age was 70. Only 16% had symptoms of mountain sickness, and these were only mild. This confirmed the limited data indicating that older people were less vulnerable than the young.

For those interested in medical topics, here’s a brief summary of the studies we did on these men and women in Vail. Two months before the gathering, we wrote to the first 900 who had registered, asking them to complete a detailed questionnaire about their health, past medical problems, experience, habits and the like. We then invited 600 respondents to be subjects in our study, and randomly selected 250 from the 450 who agreed. After arrival at Vail, each completed a questionnaire every day, asking about signs and symptoms suggestive of acute mountain sickness. Each was then examined at the same time every day at the same station by the same people.

Group One: Each day, 100 of them handed in their questionnaires, lay down on a bed at their assigned station, and in the next twenty minutes had pulse, blood pressure and blood oxygen measured while supine and after standing. A 12-lead electrocardiogram and pulmonary function were then done. Group Two: Each day the other 150 men and women handed in their questionnaires and had their pulse rate, blood pressure and oxygen saturation of blood measured, all under the same conditions.

All of the data were later entered in a large software program for statistical analysis. This enables us to look at possible correlations between some or many items on the questionnaires and the measurements we made. A great number of correlations can be examined. It is the first study of such size.

The bottom line? These older people, aged 65 to 83, even those with underlying medical problems, tolerated this moderate altitude better than expected.

Encouraging though this may be for us older folk, it doesn’t mean that we can go wherever we wish. Age inexorably weakens all parts of the oxygen transport system, so even the fittest, most experienced elderly mountaineers probably shouldn’t go higher than 18,000 to 20,000 feet—though there are some dramatic exceptions. We know that about 25% of people of all ages who visit higher mountain resorts will have symptoms, and some may be very ill indeed. And we know that anyone of any age can be badly affected by going to even moderate altitude too fast, ignoring the warning signs of altitude illness.

What these few studies do tell is that age alone should not discourage a person from skiing or climbing at a moderate pace at moderate altitude. They show that having had a heart attack or a lung problem does not necessarily mean a person cannot go to altitude. Such people need evaluation by a doctor who is thoroughly familiar with the effects—good and bad—of altitude, and who believes, as a prominent doctor mountaineer recently wrote: “Going into the mountains to trek or to cross-country ski is a safe undertaking for those who believe they are able to do so.”