Chilean miners: A long road back to 'normal'

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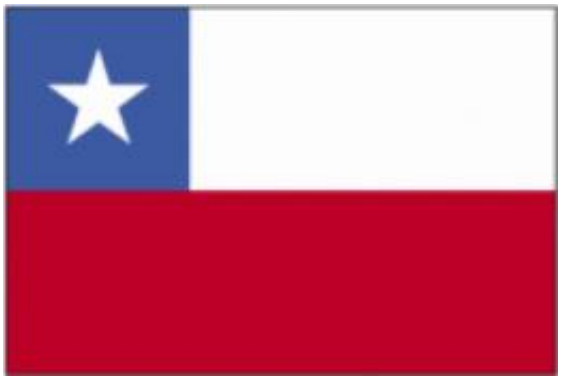

Credit: ISNS

As the Chilean miners emerged Wednesday from their dark cave in protective sunglasses, they were swept into the arms of family and friends. Reports indicate that they have discussed the media frenzy into which they will walk and have agreed to share the money they receive for telling their stories equally; but after 69 days underground, what will it be like for them to return to their normal lives when the euphoria dies down?

The Chilean government is offering the miners immediate psychiatric consultations when they emerge and psychiatric treatment for the next six months if they so desire. But their conditioning as miners and the choices they made while trapped underground may have already helped start them on the road to readjustment. The orderly mini-society they created, where every man had a job to do, kept them psychologically fit;

and the physical arrangements they devised and that were suggested by consultants played an important role as well.

In the first days of the disaster, 54-year-old Luis Urzua, a skilled topographer, organized the underground space into sleeping, working, and recreation areas, rationed food so the miners did not run out before emergency rations arrived through the first rescue hole. He also set up work details and 12-hour illumination shifts using the headlights of mine trucks to simulate daylight.

The use of headlights to simulate sunlight was suggested by NASA. According to Samir Hattar, a biologist who studies light cycles at Johns Hopkins University in Baltimore, Md., it was crucial to keeping the men in sync with the outside world.

"Our biological clock is self-sustaining without environmental stimuli, but it runs on a 24.5 hour cycle when left to itself" said Hattar. "Natural daylight adjusts this clock to exactly 24 hours so it becomes physiologically relevant to the rest of the environment and our social interactions."

Experiments have shown that, when placed in 24-hour light or 24-hour dark situations, people naturally wake a half-hour hour later every day, which adds up to a 3.5-hour time displacement by the end of a week. If the miners' sleep/wake cycle had not been adjusted with the truck lights, people from the surface trying to contact them would have disrupted their biological rhythms and caused an experience similar to jet lag.

While the truck lights were enough to keep the men's biological clocks on target, they may not have been adequate to stave off light-deficit depression, said Hattar. If the men manifest this kind of depression, which is similar to seasonal affective disorder, Hattar said that exposure to normal daylight will cure them.

George Everly Jr. of Johns Hopkins' Bloomberg School of Public Health said that he expected the rate of post-traumatic stress disorder to be lower than normal because the men "self-selected for confined space and underground conditions when they chose to be miners."

He did, however, expect all of them to experience both a physiological and psychological letdown that could lead to a need for counseling or medical support for the more vulnerable among them.

"Right now their neurotransmitters are working overtime. They are riding high on catecholamines, such as adrenaline, that energize the body to promote survival, and they are also experiencing serotonin and dopamine highs," said Everly. Serotonin and dopamine are neurotransmitters that control the brain's reward system. "That can't last forever. Whether physical exhaustion or the withdrawal of media attentions sets off the letdown, those hormone levels will decrease and the future may not look as bright as it once did."

Everly said he was also concerned about potential psychological effects as the men's sleep/wake cycles readjusts to daylight.

"We know from studying shift workers that these adjustments can be accompanied by depression and/or irritability that can veer into aggression, depending on the metabolism of the individual," he said.

If PTSD occurs in some of the men, Everly reported medicine and counseling could help. He said that a variety of psychological techniques are available to help people realize that they are not still in danger, but when these are not adequate, short courses of medication can readjust neurotransmitter levels.

"When a person is stressed, the catecholamines prepare the body for action. People become hypervigilant, startle easily, and aggressive

behavior comes more naturally to them than it normally would," Everly explained. "There are balancing mechanisms in the brain and the body's thyroid and adrenal glands that return people to a non-stressed state; but when the stress lasts for an extended period of time, those mechanisms can become so suppressed that they don't function anymore."

Selective serotonin reuptake inhibitors such as Zoloft, Prozac, and Celexa can help restore lost serotonin to the system, and medications that block the production of adrenaline, such as Effexor and Cymbalta, can help calm it down. He added that, since a condition called delayed PTSD doesn't show up for at least six months, he hopes the Chilean government will provide counseling services to the miners for at least a year.

According to CNN News, all the miners will remain in a local hospital for several days before going home, and psychological trauma will be one of the key items that caregivers will be watching for. The President of Chile has said that the country will extend all the services it can to "these national heroes" to help them recover from their experience and lead productive lives in the future.

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