

# Failure Analysis

Seeing Tomorrow Today

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Mr. Charles Bolden  
NASA Administrator, HQ  
Washington DC 20546-0001

May 9, 2013

Dr. Len Losik,  
President  
Failure Analysis  
501 Plum Street, Suite 48  
Capitola, CA 95010

Re: Leveraging Captain Liza Nowak's Mental Illnesses to Determine the Need for Working and Living in a 1g Environment in Space for NASA's Astronauts.

Dear Mr. Bolden,

In support of the Canadian Space Agency's work in prognostics and health management (PHM), I published a paper at the IEEE 2013 Aerospace Conference titled, "Using the Brain's Fight-or-Flight Response for Predicting Mental Illness on the Human Space Flight Program." The cause and cure of mental illnesses have eluded the mental health community, so I identified the recipe for acquiring mental illness in my paper. Using my recipe, mental illness can be predicted using our proprietary, data-driven predictive algorithms and diagnostic data from an astronaut's circadian and ultradian rhythms. Circadian and Ultradian rhythms are generated near the area of the brain that the FOFR is believed to exist. So when the FOFR releases cortisol and adrenaline, the locations near the FOFR are exposed to them, and any change due to premature aging will be measurable using measurement taken of the person's Circadian and Ultradian rhythms. The results of the prognostic analysis could be used to predict, prevent and cure mental illnesses on long-duration deep space missions. Our web site at [www.failureanalysisco.com](http://www.failureanalysisco.com) has available for reading or downloading PDF copies of all our papers that were presented at the Aerospace conference.

I was restricted by the CSA to discussing only anxiety and depression disorders reported by NASA even though I had compiled substantial information for the more serious mental illnesses of bi-polar disorder and schizophrenia.

Our PHM session keynote speaker was Mr. Sergey Volkov, an award winning Russian cosmonaut with 2 long duration missions to the International Space Station, summing to almost 1 year in space. Sergey stated during that he and other cosmonauts lost a full 9% of their body total mass during 6 months in space, but did not lose nearly as much on his second mission because the U.S. side of the ISS had a exercise machine that simulated weight lifting that he used for 2 hours/day.

Some of the results of my technical paper identified that people developing serious (bi-polar and schizophrenia) mental illness includes brain shrinkage and subsequent brain damage caused by the long-term exposure to cortisol and adrenaline that is released by the brain's fight or flight response (FOFR), as well as brain-induced changes to the brains chemistry. These changes in the brains chemistry result in irreversible symptoms often referred to as mood disorders and schizophrenia.

My paper includes examples of MRI's that show that people with mental illness suffer from shrunken brain including frontal lobes (without explanation why). I concluded that the long-term exposure to cortisol and adrenaline from the FOFR causes premature aging and shrinkage of the body and brain including the brains frontal lobes where most experts believe that our impulse control occurs.

A few days after I presented my paper, I received requests from journals related to mental health and asked to write similar paper for publication. In the paper I generated for the Journal, I included discussions on the cause and cure for the more serious mental illnesses of bi-polar and schizophrenia and more examples of the brain damage experienced while acquiring mental illnesses.

It is likely that an astronaut's brain in 0g degrades in unpredictable and unknown ways just as the physical body atrophies and scientific studies may need to be completed to understand the changes to those whose body and brains have been exposed to harsh and life-threatening environment of space for extended periods.

In 2007, a NASA astronaut made the national news when she suffered from several severe mental illnesses that may have been exacerbated by her extended duration stays in space. News reports stated that Captain Liza Nowak drove from Houston to Orlando, Florida, on February 4–5, 2007 taking many items with her in her plan to harm a fellow female astronaut her ex boyfriend was dating. Captain Nowak drove 900 miles to Florida to confront her boyfriend's new girl friend, Air Force Captain Colleen Shipman. On February 5, 2007, Captain Nowak went to the Orlando International Airport, waited for about an hour in the baggage claim area and then walked to the airport parking lot, where she located and confronted Shipman, who had just arrived from Houston by plane.

After her arrest, Captain Novak was diagnosed with major depression, obsessive-compulsive disorder, insomnia, and a psychotic disorder with marked stressors. Captain Nowak choose not to leverage her mental illnesses in her defense. These mental illnesses are likely to be acquired from the brain damage from over-exposure to cortisol and adrenaline. The overexposure to cortisol and adrenaline is now known to shrink the brain's frontal lobes as well other areas of the brain. Astronauts living and working in space are likely to have their FOFR activated for frequently thus compounding the brain shrinkage.

Captain Novak may be the “canary in the coal mine” offering NASA a unique opportunity to understand the likelihood of an astronaut acquiring mental illness from the degradation of the brain while it suffers from atrophy. As yet, NASA has failed to associate Captain Nowak's mental illnesses with her long duration space missions.

As astronauts take longer missions to deep space, more frequent and more serious mental illnesses are expected to occur. This is the reason that I was requested by the CSA to apply my predictive algorithms to mental illness to determine the feasibility of predicting mental illnesses. If mental illness can be predicted, it can be prevented. Working and living in a 0g environment may increase the number and severity of mental illnesses acquired by astronauts and cosmonauts and so NASA should be evaluating the need to work and live in an artificially created near, 1g environment and the requirements of the spacecraft that will provide this environment.

Developing the fundamental understanding of the functioning of the human brain and its safety mechanism causing mental illness and the ability to predict mental illness using a PHM allows mental illness to be predicted, prevented as well as cured.

Sincerely,

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