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Mind-Reading Research

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Narrator: Scientists at NASA's Glenn Research Center are learning how to monitor airline pilots' brain activity

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to determine when they are operating under dangerous levels of stress, fatigue and distraction.

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Their goal is to improve safety on commercial airplanes by helping pilots make better decisions.

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The team is testing a helmet that uses optical sensors to peer into the brain

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and detect changes in the blood flow that indicate a pilot's mental state.

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Angela Harrivel: We're monitoring the blood flow in the brain in different regions.

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And by using that data we can determine what cognitive state the pilot is in.

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And that's done through an emerging technology called functional near infrared spectroscopy,

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and that injects light into the brain which then diffuses right through the skin, the skull, the fluid, through the top

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We detect it a few centimeters away and we look for changes in the blood flow right in those various locations.

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Narrator: Fifteen NASA employees and contractors have volunteered to wear the helmet while sitting in a movi

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The test subjects are presented with a variety of distractions and stressful conditions as they fly a virtual airplan

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Angela Harrivel: We're trying to measure the response of the subjects to different functional tasks,

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whether those be simple, pure tasks or complicated multitasks.

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So by monitoring the subject's response to these simple and more complicated tasks,

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we can get an idea of how they might respond under stressful situations.

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The goal is to help pilots make better decisions in order to ensure passenger safety.

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We want to reduce the number of potential aircraft accidents by warning the pilots

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when they're under dangerous levels of stress.

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Narrator: In its current design, the helmet uses 32 diodes to monitor 16 areas of the brain.

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The researchers plan to vastly improve the comfort of the helmet,

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and hope to simplify it by reducing the number of locations in the brain that it monitors.

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Angela Harrivel: Ideally in the future we won't need all 16 locations.

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It might turn out, and that's part of what we're trying to study here,

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that certain locations are more important than others to monitor

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and that we might get the same answer with less instrumentation.

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Narrator: The research complements that of others working to simplify the delivery of information in the cockpit

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Angela Harrivel: As a result of this testing we hope to develop technology that could be designed into modern c