

CHANGES IN EXERCISE DATA MANAGEMENT

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The suite of exercise hardware aboard the International Space Station (ISS) generates an immense amount of data. The data collected from the treadmill, cycle ergometer, and resistance strength training hardware are basic exercise parameters (time, heart rate, speed, load, etc). The raw data are post processed in the laboratory and more detailed parameters are calculated from each exercise data file. Updates have recently been made to how this valuable data are stored, adding an additional level of data security, increasing data accessibility, and resulting in overall increased efficiency of medical report delivery.

Questions regarding exercise performance or how exercise may influence other variables of crew health frequently arise within the crew health care community. Inquiries over the health of the exercise hardware often need quick analysis and response to ensure the exercise system is operable on a continuous basis. Consolidating all of the exercise system data in a single repository enables a quick response to both the medical and engineering communities. A SQL server database is currently in use, and provides a secure location for all of the exercise data starting at ISS Expedition 1 – current day. The database has been structured to update derived metrics automatically, making analysis and reporting available within minutes of dropping the inflight data it into the database.

Commercial tools were evaluated to help aggregate and visualize data from the SQL database. The Tableau software provides manageable interface, which has improved the laboratory's output time of crew reports by 67%. Expansion of the SQL database to be inclusive of additional medical requirement metrics, addition of 'app-like' tools for mobile visualization, and collaborative use (e.g. operational support teams, research groups, and International Partners) of the data system is currently being explored.