Tenth International Conference on Managing Fatigue: Abstract for Review
MF-10: Use of the Psychomotor Vigilance Test (PVT) in Fitness For Work Assessments

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Problem:
We all are at increased risk of making errors at home or at work that could result in injuries when we are not alert (i.e., fatigued). However, for some of us, due to the nature of our jobs, alertness is a much greater safety issue than for others. The consequences of errors can impact not just ourselves, but also those around us as well as the environment.

By their nature, petroleum and petrochemical industries have such safety sensitive positions. ExxonMobil uses a variety of techniques to minimize the risks associated with human error. One of those is that the medical department is tasked with assessing fitness for work of people in safety sensitive positions. Assessments are performed every two years and as needed based on changes in an employee's health status.

Currently, these assessments are based primarily on professional judgment and subjective reports of symptoms that may be indicative of impaired alertness. However, the consequences of making the wrong determination can be serious. Incorrectly concluding that an individual is fit for work may increase the risk of an incident resulting in serious harm. Conversely, being overly conservative in these assessments may unnecessarily impact careers and make it more difficult to staff safety sensitive positions with qualified and experienced employees. A quantitative, validated test may be a valuable tool in performing these assessments.

Methods:
We piloted the use of the Psychomotor Vigilance Test (PVT) to objectively and quantitatively assess alertness. The PVT is a simple test of reaction time. Since its development over 30 years ago, it has become the gold standard by which other tests or alertness are validated. We utilized the PVT in a tablet-based app for 95 individuals in safety sensitive positions during their biennial physical examination. The results are uploaded to a server and then viewed by the examining clinician from a web-based platform. Measurement included the time added to the examination, the acceptability of the test to the examinees, test facilitators as well as the number of individuals found to have impaired alertness.

Results:
Use of the PVT added an average of 21 minutes to each examination. When operating as intended, the test was viewed favorably by the facilitators and the examinees. In a small number of cases, the test was disrupted by poor connectivity for uploading of data or by accidentally activating drop-down menus on the tablet. In 3 of the 95 tests, significantly impaired alertness was identified by the PVT. This impairment was not identified using a traditional history and physical examination

Discussion:

Use of the PVT improved the ability to detect impaired alertness. The test does not identify the cause of the impairment or whether it is chronic or temporary. Because these tests were done as part scheduled examinations during daytime hours, it is more likely to identify ongoing issues than transient causes of impairment. In each of the 3 cases, the employee was temporarily removed from safety sensitive work pending determination of the cause of the impaired alertness and corrective actions. The PVT was used again to confirm that the issues had been adequately addressed to allow the individuals to safely return to work. The connectivity issues identified during the pilot are being addressed by modification of the app so that accessing the data does not require it to be uploaded to a server. The issues related to activating the drop-down screen are being addressed by modifications in the training.

Conclusion:
The PVT is an effective tool in identifying impaired alertness in an occupational health setting.

In this pilot, the test detected significantly impaired alertness which had not been identified during a clinical history and physical in three of these individuals.
The PVT does not identify the cause of impairment which could be due to sleep deprivation, medication or illicit drug use, alcohol, sleep disorders or other illnesses. However, once the impairment was detected, the underlying cause was readily identified. For two individuals, the matters were relatively simple and they were able to return to their usual jobs in a matter of days. The third individual was found to have serious illnesses that had not been previously diagnosed. This individual was diagnosed, successfully treated and returned to his usual job in a matter of weeks.
, We are enhancing this tool and plan to deploy it tool across our U.S. clinics in 2017 and assuming continued positive results, extend its application further in 2018.