Avoiding sticky ethical issues

By Mark Fraser

With urine sampling being expensive and problematic and the majority of saliva tests proving to be inaccurate, Australian miners are being forced to look at new ways to test their employees for fitness of duty.

During the past two years one West Australian company has been busy establishing the credentials of an eye scanning technology which could well provide domestic mining houses a solution to this pressing occupational health and safety issue.

Developed in the USA and distributed in Australia by Clinical Medical Marketing (CMM), the Eyecheck® portable pupillometer impairment detection system is a mobile, hand held and lightweight device that measures – as well as monitors – neurological impairment through the pupil's response to light by recording absolute pupil dynamics.

It has been shown to be effective not just in the detection of a wide range of drugs, but also in the fight against fatigue by identifying fatigue as a probable cause for impairment in a worker.

Furthermore, Eyecheck® manages to elude most of the growing ethical issues raised when it comes to sampling of bodily fluids.

Although the use of urine testing has traditionally been regarded as something of an industry standard, it does not detect impairment, instead it detects past drug usage. This has become a major issue for the unions today, "They have all had major problems with urine testing in the past because it fundamentally looks at presence (past use)." CMM director Murray Simon said.

"This means if an employee smokes cannabis on the weekend and then goes back to work on Monday or Tuesday, that person is most likely going to come up positive when tested".

"But is he or she impaired? The evidence states otherwise – not from consuming something two or three days previously.

"So consequently, anecdotally at least, more workers who are social drug users are turning to harder drugs (speed, ecstasy etc), instead of cannabis because they only remain in the system for one to four days instead of the seven days to three months that pot could stay in the system.

"The current thinking is that saliva testing is more in line with impairment testing because it is closer to the blood barrier, so therefore it should give one a closer correlation to impairment, and that's probably good thinking.

"However, at this point in time at least, the chemistry behind the majority of saliva tests is simply not up to scratch."

According to Simon, saliva testing has also proven to be problematic, but is improving rapidly.

For a start, Simon explained, the saliva tests used by Victorian police are mainly looking for Tetrahydrocannabinol (or THC, which is found in cannabis) and Methamphetamines (the two most prevalent drugs found in road fatalities), many other substances are being missed, furthermore the tests they are using are to date proving unreliable and very costly to perform.

Eyecheck® on the other hand, has shown itself to be effective on a number of levels.

Aside from the fact it is non-invasive, portable, reliable, cost effective, non gender specific and quick to use (less than two minutes per person), extensive testing has shown it be accurate in detecting impairment from any drug – legal or otherwise and a bonus is its ability to detect fatigue.

Trials conducted in the US found Eyecheck® could detect impairment from an array of prescribed medications (ranging from inhalants, anti-depressants to misuse of many over the counter drugs) as well as illicit and so-called designer drugs (like ecstasy) that cause symptoms of neurological impairment.

Scanning for fatigue also proved effective, especially when it came to the running of heavy machinery. As highlighted by the Minnesota State Police: "There are clinical tests, but they can't be used on site (and) the person has to be taken to a clinic and studied".

Meanwhile, in Australia last year, the Eyecheck® was tested by a police forensics toxicologist finding that when it came to sensitivity (or how good it was at determining true positives), the technology scored 100%.

In terms of specificity (or how good it was at finding true negatives), Eyecheck® scored an almost as impressive 97.8%. Its positive predictive value (the proportion of positives that really were positive) came in at 97%, while its negative predictive value (the proportion of negatives that really were negative) was also 100%.

Simon said while other companies were developing eye-scanning technologies to test for drugs or impairment, CMM's product offered a number of advantages.

"Our competitors are using relative pupil dynamics which means that they use a video camera (30fps) to photograph the eye and use overlays to 'measure' pupil diameter. Eyecheck® uses 'absolute' pupil dynamics that collects data at 100fps and calculates real time measurements by measuring light going in and coming out of the eye as it constricts and re-dilates" he explained.

"So this means it gives a very, very accurate picture."

Currently Eyecheck® is being evaluated by NASA and a deal is set to be signed in a few weeks that could see Eyecheck® testing astronauts on the space station for fatigue and impairment within a couple of years.

In addition, Simon stressed there was a need for an alternative to current technology, technology that could differentiate between impairment and past usage or presence while providing the degree of accuracy needed when evaluating an employee's fitness for duty.