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### **Future looks liquid for Victorian Company**

Work funded through the Victorian Government's Small Technology Industry Uptake Program (STIUP) has produced critical results for the future of the Liquitab device, a unit designed to help people who struggle to swallow tablets.

Liquitab's CFO, Darren Scotti, called the Small Technologies Industry Uptake Program (STIUP) a godsend.

The Liquitab device liquidises pills making them easier to ingest.

"A pill that we were previously crushing in six minutes is now being done in 70 seconds," said Darren.

Five per cent of the general population has difficulties swallowing. For those over the age of 65, that figure rises to 15 per cent.

"The results are very impressive and we're very optimistic about getting investors to the table," he said.

"I spoke to one of the seniors out of Australian Pharmacy Group a few days ago, they said two minutes would be interesting, when I told them we were down to 70 seconds they said I must be joking," said Liquitab's Founder, Keith Dobson.

Liquitab received a STIUP technical voucher to draw on the expertise of Grey Innovation and the Melbourne Centre for Nanofabrication (MCN) to improve the design of their product.

"Grey Innovation and the Victorian Government were the difference between Liquitab happening and not," said Keith.

Users of the Liquitab Homecare Unit place water and their medication into disposable, biodegradable beakers in the device. It will then emit ultrasonic waves, or sound waves, at such a speed and frequency that they crush the pills. Once finished the lid will open and the device will beep.

In effect, the final product is a flavored liquid with very fine particles of the tablet within it.

The founder and driving force behind Liquitab, Keith Dobson, has worked in the healthcare sector for over 30 years and is constantly struck by the problems caused by swallowing pills.

"I had a dear friend here in Melbourne who had to go into an aged care facility, when I went to visit her she said that the worst thing was having to ingest six pills four times a day, so I took it upon myself to change that," Keith explained.

Keith has been working on liquidising pills for 17 years.

"It may seem very simple to get a tablet and take it down to a liquid form and then flavor it for people to ingest, but believe me that has not been the case!" said Keith.

Keith looked at every conceivable method of crushing pills, starting with coffee grinders and ultimately deciding upon ultrasonics.

"10 years ago I started off with a seven-foot machine; the ultrasonic probe could have put someone on the moon it was actually that big," said Keith.

The modern incarnation of the product is a compact unit, able to be placed between a toaster and kettle.

Keith's mother has been using one of the Liquitab prototypes for two years and has first-hand knowledge of its benefits.

"My mother has had her throat dilated for many years now because of the difficulty of swallowing medications. With the device she puts her medication on, brushes her teeth and comes back and the lid's up showing that the process is finished, ready for her to swallow," explained Keith.

"We've had a working prototype for two years. We did some testing internally on the prototype and identified that of the top 30 drugs on the Pharmaceutical Benefits Scheme (PBS) we were able to successfully crush between 70 and 80 per cent of the pill," said Darren.

After two years of trying to raise funds to commercialise in the extremely risk-adverse, post GFC environment, the company decided that they had to do something different.

"What's the definition of insanity? Doing the same thing and expecting a different result," said Darren.

"MCN basically are the ultrasonics experts and Grey Innovation are the design experts. They work together," said Darren.

By altering the electronics of the system and the position of the ultrasonics emitter, Grey and MCN were able to greatly improve the efficiency of the energy transfer from the emitter into the pills.

Along with the significant increase in speed, by refining the design they were able to ensure a more thorough crushing of the tablets.

"When we were doing it previously you could see small particles floating in the water and now you can't see it at all," explained Darren.

Over the course of Keith's 17 years of working on Liquitab there has been notable market interest in the idea.

"10 years ago I showed the 7ft prototype at a show in Florida and I always remember a chap from Texas came to me and told me that he only had a small organisation, 2,000 or 3,000 nursing homes, but that he'd put Liquitab in them and I had to say sorry because I didn't have any," recalls Keith.

Currently the preeminent tool for crushing tablets is the mortar and pestle. This procedure has multiple problems associated with it.

"When you use a mortar and pestle you're losing 1/3 of the active ingredient. If you've got a medication that's not 2 micrograms, you can imagine the impact upon that," explained Keith.

The mortar and pestle also poses issues of cross-contamination and a potential for accidental inhalation of active ingredients.

"What the ultrasonics does is crush the tablet so, in a lot of ways it's no different to a mortar and pestle, the difference is that it's your medicine, it's nobody else's," said Darren.

Nurses will benefit from the Liquitab device as well as patients.

"The reason nurses won't work in nursing homes is because if they work in the morning they spend three hours squashing medication and spend 3 hours in the afternoon. That's six hours out of an eight-hour shift," said Keith.

"Nurses are there to make the patients more comfortable, instead they're spending 2, 3, 4 minutes for each patient crushing tablets, which is not valuable use of their time," said Darren.

Liquitab are confident that their device could cut medication rounds in nursing homes by 70 per cent.

"This is such an exciting project. You can really see how this product offers not only benefits to society, but also allows nursing staff to work in a more efficient environment," said STIUP Program Manager, Buzz Palmer.

As well as the Homecare unit, Liquitab has a concept design for an institutional unit to be used in nursing homes, hospitals, correctional facilities, etc.

"There's obviously a lot more work in getting the institutional unit to work because the speed of use is much more important in that environment than it is in the homecare environment," explained Darren.

But the results of Grey Innovation's work have greatly reduced the time to market for the institutional device.

"We believe the technology is actually now ready for a commercial unit, not just a Homecare unit," said Darren.

Before the results of the technical voucher, Liquitab had planned to invest significant capital to get the institutional unit ready to be introduced to the market 12 months after the Homecare unit.

"Our benchmark for the Homecare unit was between two and three minutes, but for an institutional unit that might be too long. We wanted to get it to two minutes preferably and we've done that with this trial," said Darren.

"It's just been an overwhelming success from that perspective," he said.

Liquitab have entered into a commercialisation agreement with Grey Innovation for the products.

"I think that the government has sourced some of the best people in the world in Grey Innovation, they have done magnificent work," said Keith.

From these results, Liquitab's next steps include further in-house tests to measure the device's efficacy, a marketing study and production of more prototypes that can be shown to

potential distributors and investors. There is also talk of a small-scale commercial trial; putting prototypes into nursing homes to see how the device would fit into procedures.

“By the end of the quarter, we should be able to put together a very robust business plan,” said Darren.

“We’ve spoken with Boots in the UK, they’ve got over 128,000 pharmacies across Europe. We’re speaking to one of the largest distributors in Australia for distribution rights. We have a tacit agreement with a distributor in Canada and we’ve got significant interest out of the US,” said Keith.

The company plans to start distribution in Australia and Canada first, followed by the UK and phase three into the US.

In the long run Liquitab plan to explore the other potential applications for this technology.

Darren praised the straightforward STIUP application process.

“From an outsider’s perspective it worked very smoothly with a very quick turnaround,” he said.

“I’ve had a couple of conversations with STC over the course of the last few months and they’ve always been really helpful and encouraging. It feels as if we have an advocate in STC,” he said.

STIUP is an initiative of the Victorian Government designed to give Victorian business the opportunity to increase their competitiveness by integrating small technologies into products, processes and services.

“It was a lifesaver. The STIUP voucher really assisted us to take Liquitab from where it was, to where it is today. That was the difference,” said Keith.

For more information about the Small Technologies Industry Uptake Program (STIUP) please visit: <http://stc-melbourne.com/index.php/stiup>

For more information on Liquitab, please visit: <http://www.liquidabsystems.com.au/>

Media Enquiries:

 Katherine Wilkinson  
**escalier B** communications  
Katherine@EscalierB.com.au  
+61 400 309 554