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It Is Not Reasonable to Guess About Pain

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Abstract: PainChek is an Australian-listed company that had developed a new artificial intelligence-based pain assessment tool. Their tool provides healthcare professionals and carers with an objective way of assessing pain in patients who cannot verbalise their pain.

Keywords: PainChek, artificial intelligence, pain

1. The success story—PainChek

If you have a loved one with dementia, how do you know whether their behaviour is the result of their condition or if pain contributes? The sad truth is that patients with dementia cannot tell us if they are in pain¹. A common preventative approach has been to sedate patients with challenging behaviours. Prof. Jeff Hughes, PainChek Ltd's CFO, says that having to guess whether someone is in pain is simply unreasonable.

PainChek Ltd is an Australian-listed company that provides electronic pain assessment through a smart device App. Their tool provides healthcare professionals and carers with an objective way of assessing pain in patients who cannot verbalise their pain. The company listed in 2016, acquired its first customer in 2017, and by Dec 2019, expanded to 31,000 beds under a contract with 73,000 completed clinical assessments, reaching a \$200 M market cap. They have extended their operations into New Zealand, Singapore, and the United Kingdom. The company has since secured regulatory clearance in Australia and Europe. As a result of a \$5 M Federal Government grant in 2019, PainChek is currently being rolled out to 100,000 people living with dementia in residential aged care across Australia.

2. Where did it start and the motivation?

The company was initially founded by researchers from Curtin University—Mr. Mustafa Atee, Prof. Jeff Hughes, and Dr Kreshnik Hoti. Operating as clinical pharmacists, the three co-founders witnessed the difficulties experienced by patients' inability to verbalise their pain. Over the years of documenting reviews from thousands of patients in aged care facilities, Prof Hughes observed that patients with dementia frequently experienced an escalation in anti-psychotic drugs to treat their behavioural issues. However, pain medications were little changed, despite the understanding that older people have a higher incidence of pain. This

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raised his concern that patients with advanced dementia were not appropriately medicated. Could needless suffering be reduced, and patient outcomes improved through better pain management?

The project began as a PhD project focused on how to improve pain management through better pain assessment. Grants from Dementia Australia supported the research. The team further engaged NViso, a Swiss software company with facial recognition expertise, to build their first smart device app. The collaboration resulted in a new multidimensional pain assessment tool that used both artificial intelligences to automate the detection of pain-related facial micro-expressions and smart automation to collect non-facial pain-related cues.

3. The journey so far

Initial angel investors funded the establishment of a private spin-out in 2014. In 2016, in partnership with Curtin University's commercialisation team, the founders participated in CSIRO's ON Accelerate program, successfully negotiated a reverse takeover to list on the ASX, secured a new Board, and engaged medical device expert, Philip Daffas, as CEO. The company has subsequently raised over \$13m in three capital rounds.



Figure 1. The above photo is of (from left to right) Philip Daffas (CEO), Jeff Hughes (Chief Scientific Officer (CSO)), Scott Robertson (CTO), and Mustafa Atee (Senior Research Scientist/State Account Manager for WA and SA).

4. Look into the future

PainChek's current focus is Australia-wide expansion and international market entry: Europe and the US. The company has initiated the process to obtain FDA regulatory approval in the US. Further, R&D pipeline expansion is underway with a new product specifically targeting pre-verbal children.

PainChek's CEO, Philip Daffas, advocates start-ups should focus on completing one goal at a time to a high standard, but also be aware of opportunities when they arise. *'...these things evolve and... you have to grab it when it happens and put a focus on it and make it work...'*

With interest from global players in the hospital sector, such as Philips, the PainChek team participated in Philip's accelerator program. This opportunity will facilitate partnership discussions and potentially facilitate their entry into the hospital network.

The company



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Sam Dymond is a Business Development Manager at Curtin University and has more than ten years' experience within the university sector, supporting researchers, identifying, and managing IP, and seeking commercial and community outcomes. She was with Murdoch University for nine years, heading up the commercialisation team from 2011–2017, and during that time, served on the Board of several university spin-out companies. She joined Curtin University's commercialisation team in April 2019 and has also consulted as a professional writer, writing Impact Case studies and other documents for the university sector.

Sam is a graduate of the Australian Institute of Company Directors and holds a Bachelor of Science (Physics) from Murdoch University, a Master of Business Administration from Curtin University. She is currently studying a Graduate Diploma in Writing and Literature at Deakin University. Sam's background includes various roles within the Commonwealth Government, assessing, guiding, and assisting businesses to apply for Innovation programs, such as Patents, the R&D Tax Concession, and various granting programs.

