



## ePAT Investor Presentation

11 May 2016

Please find attached a presentation prepared by Electronic Pain Assessment Technology (ePAT) Pty Ltd (**ePAT**) that focuses on the App that ePAT is developing for the assessment of pain in patients with dementia. ePAT is also developing an App for the assessment of pain in young children and will provide information on the progress in the development of this App in the coming weeks.

ePAT has released two videos on social media that provide further information in relation to the ePAT apps for the assessment of pain in dementia patients and young children. Those videos may be viewed via the following link:

<https://plus.google.com/106021522570079436809>

### **DIRECTORS**

Frank Terranova  
*Non-Executive Chairman*

Jeremy Read  
*Managing Director*

Paul Niardone  
*Non-Executive Director*

Adam Davey  
*Non-Executive Director*

Stephen Kelly  
*Company Secretary*

### **SHARE INFORMATION**

ASX Code: MNQ  
Issued Capital:  
296,805,545 Fully Paid  
Shares  
72,936,522 Listed Options  
15,619,853 Unlisted Options

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### **About ePAT**

On 14 April 2016, MinQuest announced that it has entered in a binding heads of agreement to acquire 100% of the issued capital of ePAT.

ePAT is developing revolutionary mobile medical applications that use facial recognition software to facilitate and improve pain assessment in patients that are unable to communicate ("App"). The App is being developed and rolled out in two phases; one for patients with dementia who have lost the ability to communicate with their carers and the second for young children who have not yet learnt to speak. The ePAT Apps are being developed for the global market, initially for health care professionals and professional carers of patients with dementia and subsequently for parents and carers of young children. ePAT is anticipating obtaining any required regulatory approvals for the App for patients with dementia, to be classed as a medical device in Australia, by June 2017.



### **Forward Looking Statements**

This announcement contains "forward-looking statements". Such forward-looking statements include, without limitation: proposed developments in the Company's business, estimates of future earnings, the sensitivity of earnings to commodity prices and foreign exchange rate movements; estimates of future production and sales; estimates of future cash flows, the sensitivity of cash flows to commodity prices and foreign exchange rate movements; statements regarding future debt repayments; estimates of future capital expenditures; estimates of resources and statements regarding future exploration results; and where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward looking statements are subject to risks, uncertainties and other factors, which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include, but are not limited to competition with the Company's business activities, changes in technology, the ability of the Company to obtain and maintain any required regulatory approvals for its current or proposed business activities, commodity price volatility, currency fluctuations, increased production costs and variances in resource or reserve rates from those assumed in the company's plans, as well as political and operational risks in the countries and states in which we operate or sell product to, and governmental regulation and judicial outcomes. For a more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other filings. The Company does not undertake any obligation to release publicly any revisions to any "forward looking statement" to reflect events or circumstances after the date of this release, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities law.



e P A T  
P T Y L T D

Innovators in pain assessment

Professor Jeff Hughes  
CEO

# The Problem

In people who are unable to self-report the presence and severity of their pain, they have to rely on a third party to do so, and this can be very challenging. As a result pain often goes under detected and under managed.

Thus the problem we are trying to solve is the **inability to accurately and objectively detect and quantify pain** in individuals who are **unable to communicate verbally**.

Initially in people with moderate to severe cognitive impairment, such as those with **dementia**.

In the future in **preverbal children** including neonates and infants, and then **other people with communication difficulties** such as stroke victims.



# Our Solution

A point of care App which takes advantage of the cameras and processors in smart devices to capture a short (~ 10 second) video which is analysed in real-time to identify facial micro-expressions indicative of presence of pain.

These data are then combined with non-facial pain cues (vocalisations, movements and behaviours) captured through the app to automatically calculate a pain severity score.

The App will be designed to allow pain assessments to be simple, accurate, objective and reproducible.



# This is a big opportunity because:

**Pain is common among older people** due to the increased prevalence of age-related diseases like osteoporosis and arthritis. This also applies to **patients with dementia** living in nursing homes of whom approximately **50% are in pain**.<sup>1</sup>

According to Zwakhalen and colleagues<sup>2</sup> in their systematic review of behavioural pain assessment tools stated:

“There is **evidence that pain assessment is currently inadequate** and that elderly people with dementia are being undertreated [[5](#), [6](#), [18](#), [19](#), [20](#), [21](#)]. This under treatment could lead to **various additional problems like cognitive** (e.g. concentration problems) and

**behavioural symptoms** (e.g. aggression or depression) at patient level, as well as **to greater and heavier demands on caregivers** and **increased care demands and costs** at organization level. **The main reason for under treatment is under detection** [[4](#), [5](#)].

Existing evidence of under reported, under detected and under treated pain among people with dementia provides the clearest argument for the urgent need to use a pain assessment scale regularly. Assessment to detect pain is thus essential, and is the first crucial step towards adequate treatment of geriatric pain patients with dementia [[22](#)]. **There is therefore a need for manageable, valid and reliable pain assessment tools.**”

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1. BMC Geriatrics 2015; 15:49 doi: 10.1186/s12877-015-0048-6

2. BMC Geriatrics 2006 ;6:3 doi: 10.1186/1471-2318-6-3

# This is a big opportunity because:

## Australian Statistics<sup>1</sup>

- There are more than 353,800 Australians living with dementia.
- This number is expected to increase to 400,000 in less than five years and almost 900,000 by 2050 without a medical breakthrough.
- Three in ten people over the age of 85 and almost one in ten people over 65 have dementia.
- An estimated **1.2 million people** are **involved in the care** of a person with dementia.
- Dementia is the second leading cause of death in Australia and there is no cure.

## Globally

- Worldwide, 47.5 million people have dementia and there are 7.7 million new cases every year<sup>2</sup>
- New case diagnosed **every 3 seconds**<sup>3</sup>
- The total number of people with dementia is projected to 75.6 million in 2030 and almost triple by 2050 to 135.5 million<sup>3</sup>
- The total estimated worldwide cost of dementia in 2015 is US\$ 818 billion. By 2018, dementia will become a trillion dollar disease, rising to US\$ 2 trillion by 2030<sup>3</sup>

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1. Alzheimer's Australia Key Facts and Statistics 2016  
2. WHO. Dementia Fact sheet April 2016  
3. World Alzheimer Report 2015 The Global Impact of Dementia

# Our Market

- **Institutions**

- Aged care homes and hospitals

- Patient care **software vendors**

- Healthcare **professionals**

- **Carers** of people with dementia

## Australia data

2,725 residential aged care facilities providing 187,941 places<sup>1</sup>

Registered health care professionals in Australia in 2014 was 610,148<sup>2</sup>

It is estimated that there are 1.2 million carers of patients with dementia<sup>3</sup>

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1. AIWH Aged care services and places 2011-12
2. <http://www.aihw.gov.au/workforce/>
3. Alzheimer's Australia Key Facts and Statistics 2016

# We will acquire customers by:

- **Partnerships** with **key industry leaders** such as those who have or will be participating in our validation and implementation studies
- **Endorsement** of peak bodies for example Alzheimer's Australia which provided a grant to develop the prototype of the app
- Exposure through the **Lay Press** and **Social Media**
- **Publication/presentation** both nationally and internationally

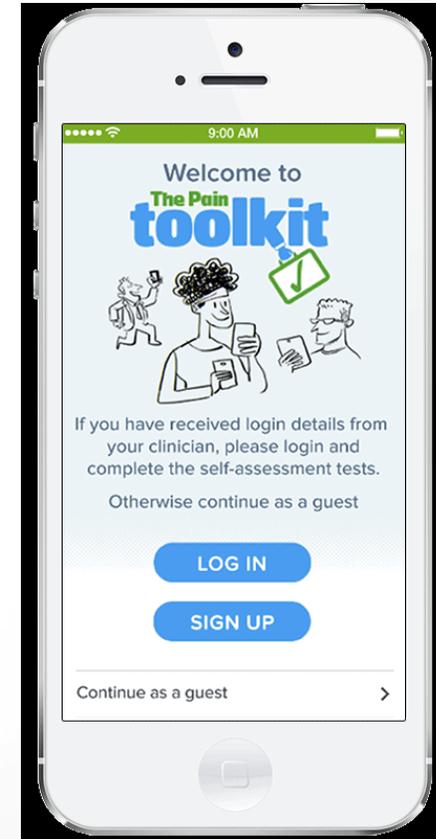
# We will generate revenue by:

“Subject to the successful development of commercial versions of the App, the completion of validation studies and the receipt of all necessary regulatory approvals”

- **Licencing** the software to Institutions (hospitals and aged care homes) and Healthcare Software Providers
- **Direct sales of subscriptions** to home carers (including health care professionals and lay carers) via Google Play and the App Store

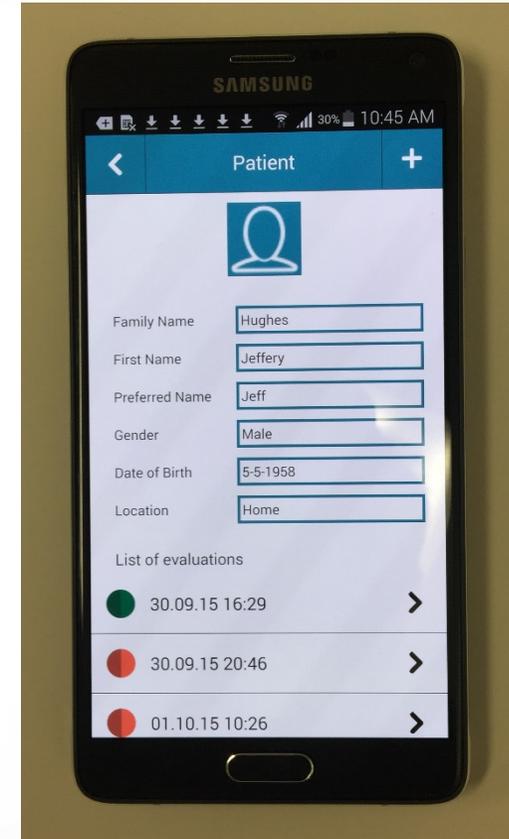
# Lack of competition...Market Opportunities

- The pain App's on the market currently as principally **digitalized, non-automated** versions of currently available pain assessment tool.
- The majority of other available pain apps are for self management of pain, and they are often criticized for **lack of theoretical rationale** and **scientific validity**, and **healthcare professional input** in their development.
- The ePAT App is the only pain assessment App with a scientific and theoretical basis.



# ePAT is better because:

- The ePAT App is **unique**, it is the first to **use facial recognition technology for pain detection** on a **smart device**.
- It has a **strong scientific basis**.
- **Before** its release, we will **validate** its accuracy through clinical trials.



# Our team

The team has a strong track record in clinical practice, research and development, innovation and commercialisation.

## Inventors and Founders from School of Pharmacy, Curtin University



Jeff Hughes



Dr Kreshnik Hoti



Mustafa Atee

## Board Members



Rohan McDougall  
Head, Commercialization Unit



Prof Kevin Fynn  
Head, School of Computing  
& Electrical Engineering

# Our team

Further, we have engaged **nViso**, an IBM award winning Swiss company, recognized for their **expertise in micro-expression** analysis to assist the app development

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## INSIGHTS FOR MARKET RESEARCHERS

Explore how emotion analytics provide more accurate metrics in a solution that is both incisive and scalable.

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### SCALABLE

Cloud service to measure emotions based on automated facial expression recognition and eye movements. Free from wires and electrodes.

### PRECISE

Passively capture human emotions from facial expressions and eye movements by tracking hundreds of muscle movements using only a webcam.

### ONLINE & OFFLINE

Available in a wide range of online and offline platforms including mobile and webapps. Integrates into existing survey frameworks and platforms.

### REAL-TIME

Optimized for measuring emotions online with cloud computing and real-time operation. Capable to service high volume applications.

## TURNING EMOTION INTO INSIGHT.

nViso provides the most scalable, robust, and accurate cloud service to measure instantaneous emotional reactions of consumers in online environments. We provide real-time and highly actionable information for **Market Research**, **Brands**, **Creative Agencies** and **R&D Product Development**.

Using **award winning** and proprietary **3D Facial Imaging** technology, compatible with ordinary webcams, we uncover the why and how of customer behaviour in real-time, letting brands make smarter business decisions.

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**ESOMAR Asia Pacific 2014**  
Jakarta, Indonesia / 11-13 May, 2014

**ESOMAR** WORLD RESEARCH

A key question for Asian retailers is the degree to which "soft factors", such as shopper reactions to branding or in-store experiences, impacts satisfaction and shopper spend. In Indonesia, answering this question is complicated by the respondent's tendency towards 'top-box bias' in rating stores. We

**nViso Joins Collaborative Effort To Reinvent Ad Research In Asia.**  
4th April, 2013

Asian brand and marketing research specialists Cimigo announced that they have joined forces with MR design consultancy Gordon & McCallum and Swiss emotion technology company nViso to launch a large scale study of Advertising in Asia: AsiaEmotion. Based on nViso's award winning and proprietary 3D Facial Imaging technology, the syndicated study directly measured emotional response to advertising in five key Asian markets. nViso's technology automatically records emotional response based on facial expressions of respondents. This allows researchers to scientifically measure respondent's real reaction to a video without requiring

# To date we have:

- Developed working Android prototype of the app (November 2013)
- Established ePAT Pty Ltd in October 2014
- Protected our IP through lodgment of international patent application
- Attracted funding through grants and venture capital
- Undertaken validation studies using the prototype app which has demonstrated excellent performance of ePAT when compared to the current gold standard used in aged care homes in Australia, Abbey Pain Scale.

# Validation study results

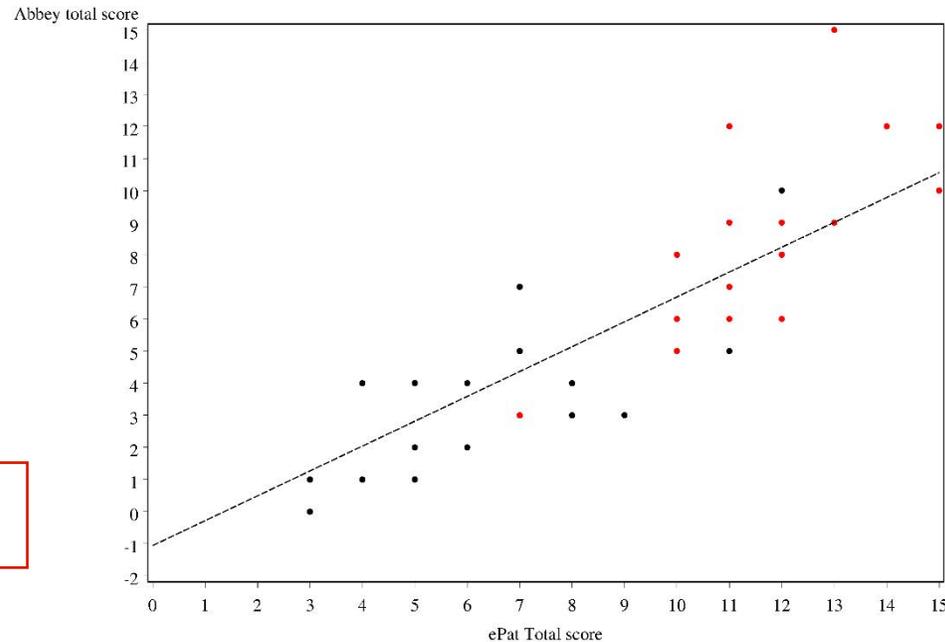
Pilot Validation studies in patients with moderate to severe dementia completed in 3 Residential Aged Care Facilities

## ePAT vs Abbey Pain Scale

Patients n = 40

Assessments n = 228

Correlation coefficient = 0.90

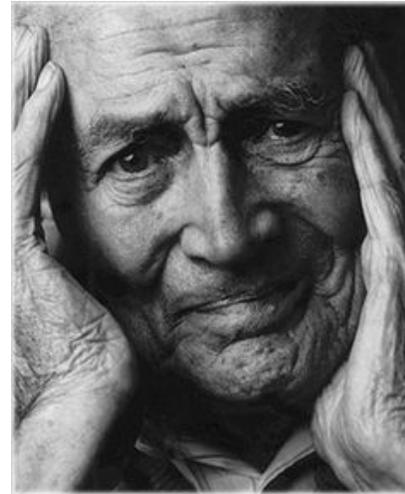


# What we'll do next:

- Continue development of commercial versions of the app, both Android and iOS.
- Complete validation studies of the commercial app in partnership with Mercy Care and implementation studies with industry partners, including Bupa in the second half of 2016.
- Apply for registration of the app as a medical device with the TGA, EU and FDA once the validation studies are complete. The target is to have the app registered with the TGA by June 2017.
- Develop a comprehensive pricing and marketing strategy based on the results of the implementation studies and in consultation with industry partner.



**If a picture paints a thousand words**



**Just imagine what your face can  
tell us about your pain**