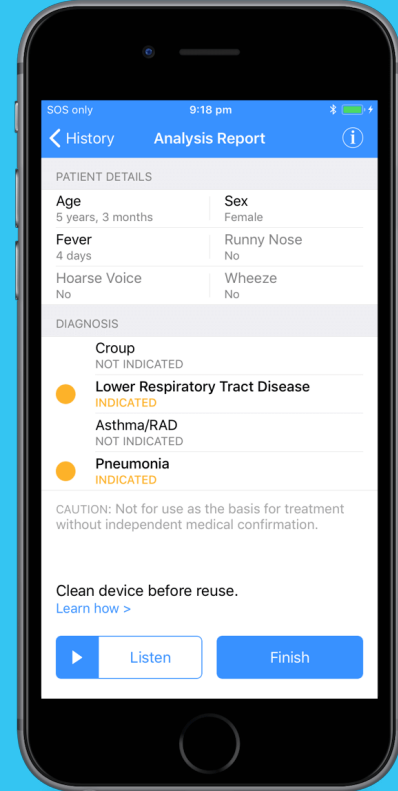




Digital healthcare for respiratory disease

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AusBiotech Hong Kong Biotech Invest & Partnering
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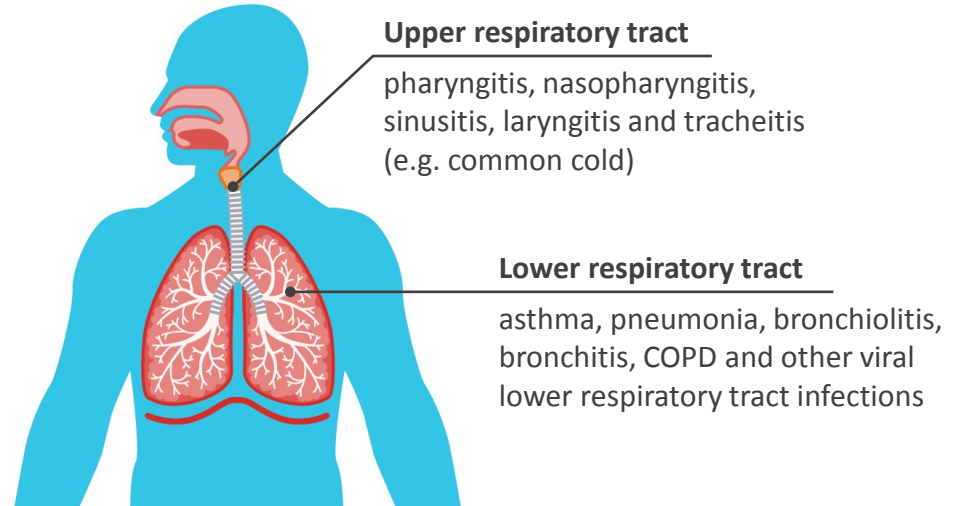
ASX: RAP

Digital healthcare for respiratory disease

- Developing the world's first clinically-validated, regulatory-cleared respiratory disease diagnostic test and management tools for smartphones
- Huge global market, 700 million+ doctor visits annually for respiratory disease¹
- Compelling clinical evidence with 4,000+ patients enrolled in Australian and US clinical studies, including positive results from two double-blind, prospective paediatric studies
- Regulatory filings submitted or underway in Europe, Australia and the US
- Well-funded to execute our commercialisation strategy
- Broadening product portfolio
 - Promising proof-of-concept results in chronic respiratory disease management
 - Excellent results from double-blind, prospective study for screening of obstructive sleep apnoea
 - Partnership with Lockheed Martin on US DARPA WASH research program

Diagnosis of respiratory disease is the most common outcome from a visit to the doctor¹

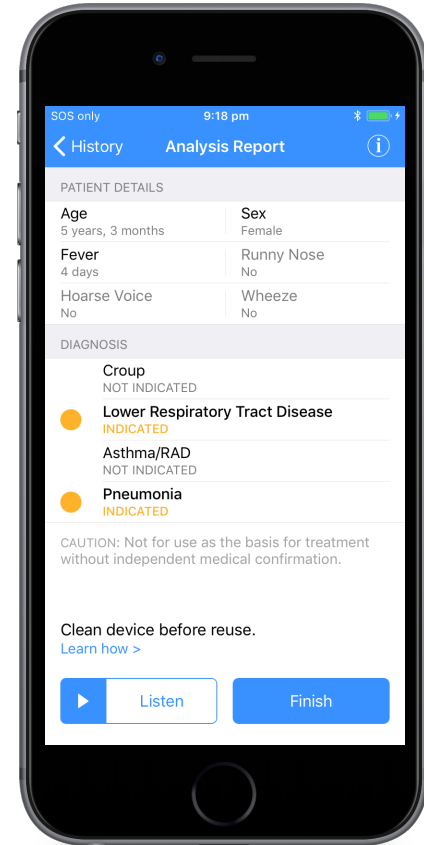
- 700M+ doctor visits p.a. globally for respiratory disease²
- Most common reasons for hospital admission³
 - Bronchiolitis (infants)
 - Asthma and pneumonia (children)
- US\$10.6B p.a. direct US hospital costs for pneumonia⁴
- High prevalence and growth in Asia
 - 100M adults in China with COPD⁵



Diagnosed today using stethoscope, imaging (x-ray, CT), spirometry, blood and/or sputum tests
→ **Time consuming, expensive, subjective and not very accurate**

Easy to use, instant diagnosis using only a smartphone

- Machine learning technology developed by Associate Professor Abeyratne at The University of Queensland
 - Uses signatures in cough sounds to instantly differentially diagnose respiratory disease
 - Able to automatically improve performance and learn new diseases from new clinical datasets
- Uses the built-in microphone in modern smartphones
 - No additional hardware/accessories required
 - Real-time on-device analysis, no connectivity/cloud needed
- Growing patent portfolio and data assets
 - Core patent granted in US, Australia and Japan¹, in national phase examination in Europe, China, South Korea; three additional patent applications
 - Proprietary data set, over 4,000 patients' cough and breathing sounds and matching clinical signs, symptoms and diagnosis



Compelling clinical evidence from multiple clinical studies in Australia and the US

Paediatric

Breathe Easy

ANZCTR: ACTRN12618001521213

585 patient, double-blind, prospective study at two Australian hospitals completed

83-97% PPA and 81-91% NPA compared to clinical diagnosis for lower respiratory tract disease, croup, bronchiolitis, pneumonia and asthma/RAD

CE Technical File submitted in December 2018

SMARTCOUGH-C-2

ClinicalTrials.gov: NCT03392363

1,470 patient, double-blind, prospective study at MGH, Cleveland Clinic and Texas Children's Hospital completed

73-77% PPA and 70-86% NPA compared to clinical diagnosis for upper respiratory tract disease, lower respiratory tract disease, croup and asthma/RAD

Pneumonia and bronchiolitis results <70% PPA and NPA due to observed clinical practice differences between US and Australia

FDA De Novo submission planned for Q1 CY2019

Adult

Breathe Easy

ANZCTR: ACTRN12618001521213

1,387 patient pilot study at two Australian hospitals completed

87-91% PPA and 88-90% NPA compared to clinical diagnosis for pneumonia, asthma and COPD exacerbations

87-89% PPA and 87-90% NPA compared to lung function testing for COPD and chronic asthma

Results from double-blind, prospective study due in Q1 CY2019

Unique opportunity in telehealth, one of the fastest growing areas in healthcare globally

- US telehealth leads, with rapid growth in primary care:

75M

consults p.a.

(US telehealth 'evisits' in 2014 estimated by Deloitte)¹

56%

growth

(Global telehealth revenue growth rate until 2018 estimated by IHS)²

US\$12B

US TAM

(Goldman Sachs US total addressable market estimate)³



- Growth in Europe and Asia Pacific

- Online consultations in China estimated by Frost and Sullivan to reach 4 billion p.a. by 2026⁴
- Ping An Good Doctor performs 531,000 online consults per day⁵



- 30-50% of telehealth consults are for respiratory disease^{6,7}
 - Today there is **no ability to use a stethoscope** and **no accurate remote diagnosis tools available**
- ResApp's test can be delivered anywhere, anytime while retaining a clinician's input

1. Deloitte, eVisits: the 21st century housecall (August 2014)

2. IHS, World Market for Telehealth (2014)

3. Goldman Sachs Equity Research, The Digital Revolution Comes to US Healthcare (June 2015)

4. Frost and Sullivan Research, commissioned by Ping An via http://www.pahtg.com/media/1144/e_1833ipo.pdf

5. Ping An Good Doctor June 2018 Interim Results, <http://www.pahtg.com/media/1238/ping-an-good-doctor-2018-interim-results.pdf>

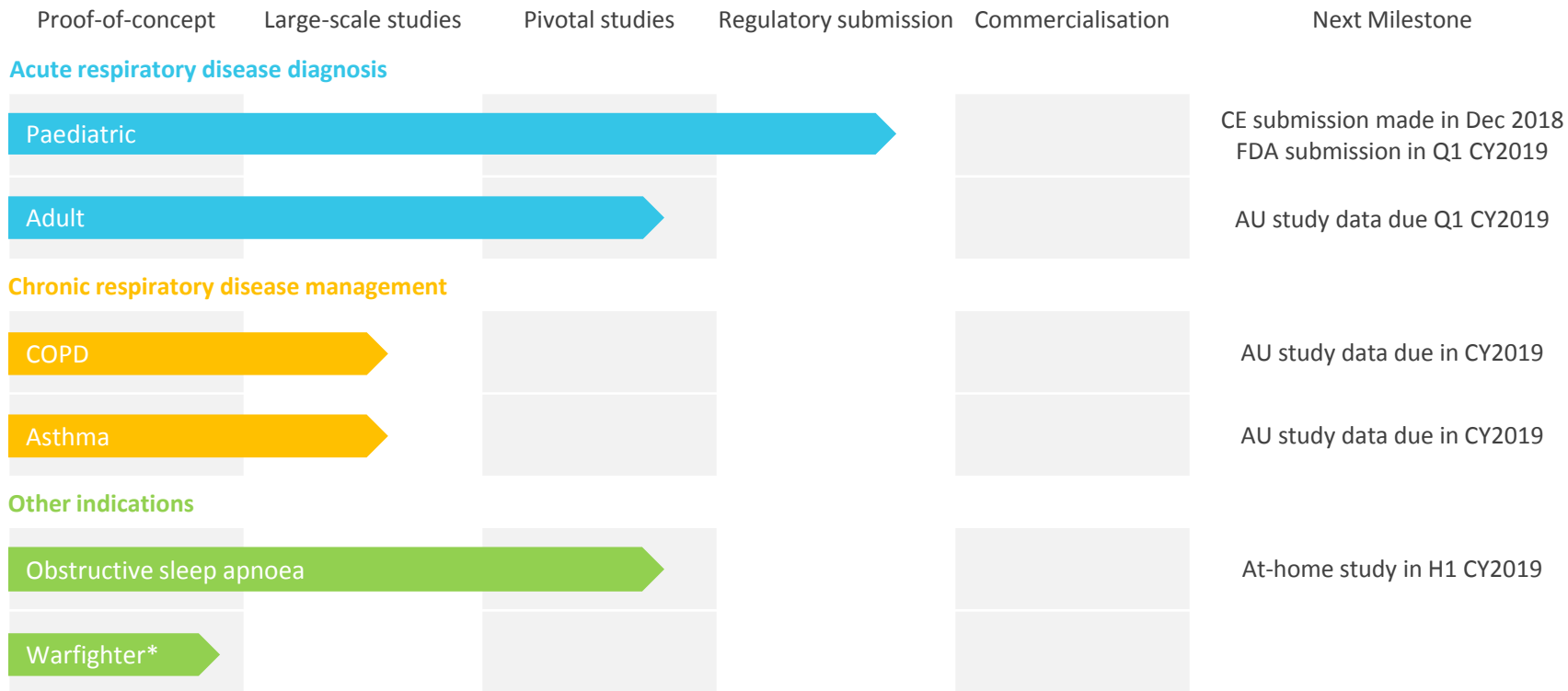
6. Uscher-Pines and Mehrotra (Health Affairs, 2014)

7. UnitedHealthcare Presentation (<https://www.mobihealthnews.com/content/health-insurance-payer-related-digital-health-news-q2-2016>)

Targeting multiple market segments

	Telehealth	Clinical use	Developing world	Direct to consumer
Market size	<p>700M doctor visits in OECD for respiratory disease p.a.¹</p> <p>• 22.5M respiratory-related US telehealth consults p.a.²</p>	<p>• 13.4M US ED visits for respiratory disease p.a.³ (~4.6M for children)</p>	<ul style="list-style-type: none"> • 1M child deaths due to pneumonia p.a.⁴ • 151M cases of pneumonia in developing countries p.a.⁴ 	<ul style="list-style-type: none"> • 400M iPhone users⁵ • 1.6B Android users⁵ • mHealth app market expected to grow to \$31B by end of 2020⁶
Value proposition	<ul style="list-style-type: none"> ✓ The only remote clinically-accurate diagnostic tool available ✓ Easily integrated into existing platforms 	<ul style="list-style-type: none"> ✓ Reduce costs (<\$10 vs >\$200 for x-ray) ✓ Reduce time (x-ray adds ~30 mins, cultures can take days) 	<ul style="list-style-type: none"> ✓ Low cost, accurate & fast ✓ Usable by non-medical personnel ✓ Integrates into IMCI framework 	<ul style="list-style-type: none"> ✓ Convenience ✓ Low cost ✓ Consumer empowerment
Commercial strategy	Partner with telehealth providers to reach tens of millions of patients	Initial use in emergency departments (ED), extending to regular clinics	Partner with leading international aid agencies to equip field personnel	Direct to consumer via app stores to target growth in consumer-led health
Revenue model	\$5-\$10 per test fee from telehealth providers	\$5-\$10 per test fee from healthcare payors	annual subscription from aid agencies	download and per test fee direct from consumers

Broadening product portfolio



Improving chronic respiratory disease management

- Estimated 339M people globally have asthma¹
 - \$80B+ p.a. US economic burden (2013)²
 - Patient adherence to asthma medications is generally very poor
- 251M cases of COPD in 2016³
 - Emphysema and chronic bronchitis, primarily caused by smoking
 - 3.17M people died of COPD in 2015, 5% of all deaths globally³



1 in 7 children has asthma⁴



1 in 5 adults over 45 has COPD⁵

- Opportunity to measure the severity of asthma and COPD, without the cost of additional hardware or the need to carry an extra device
 - Demonstrated 94% accuracy in identifying asthma patients who require additional treatment
 - Identified infective exacerbations in COPD patients at 91% PPA and 90% NPA

1. The Global Asthma Report 2018 (Global Asthma Network), citing the 2016 Global Burden of Disease Study

2. US CDC, <https://www.ajmc.com/newsroom/cdc-study-puts-economic-burden-of-asthma-at-more-than-80-billion-per-year>

3. WHO, citing the 2015 Global Burden of Disease Study, [http://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-\(copd\)](http://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd))

4. International Study of Asthma and Allergies in Childhood via 2014 Global Asthma Report, <http://www.globalasthmareport.org/2014/priority/ncd.php>

5. COPD Foundation, <https://www.copdfoundation.org/About-Us/Press-Room/Press-Releases/Article/965/COPD-Foundation-Goes-Orange-for-National-COPD-Awareness-Month-in-November.aspx>

Sleep apnoea is the most common sleep breathing disorder¹ and is significantly underdiagnosed

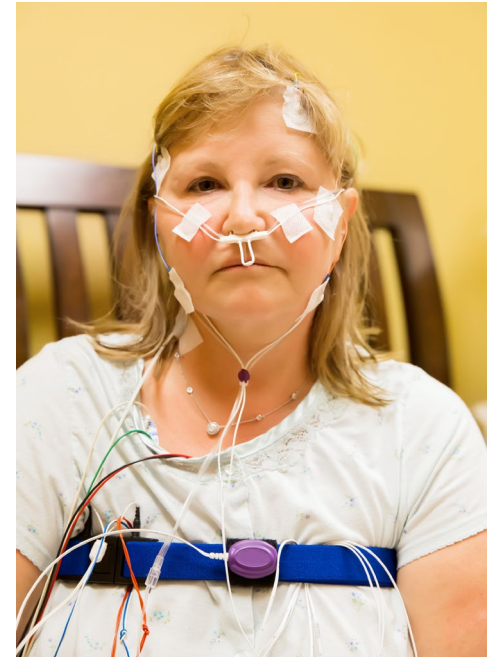
- Studies have found that more than 3 in 10 men, and nearly 2 in 10 women have sleep apnoea²
- Estimated 80% of adults with sleep apnoea are undiagnosed³
- Linked to heart disease, stroke and type 2 diabetes⁴
- Major barriers to diagnosis:

Sleep laboratory polysomnography (PSG)

Requires referral
Long wait times
\$600-\$5,000 per test
Uncomfortable & unfamiliar environment

Home sleep testing (HST)

Requires referral & training
Up to 18% failure rate⁵
\$150-\$500 per test
Uncomfortable



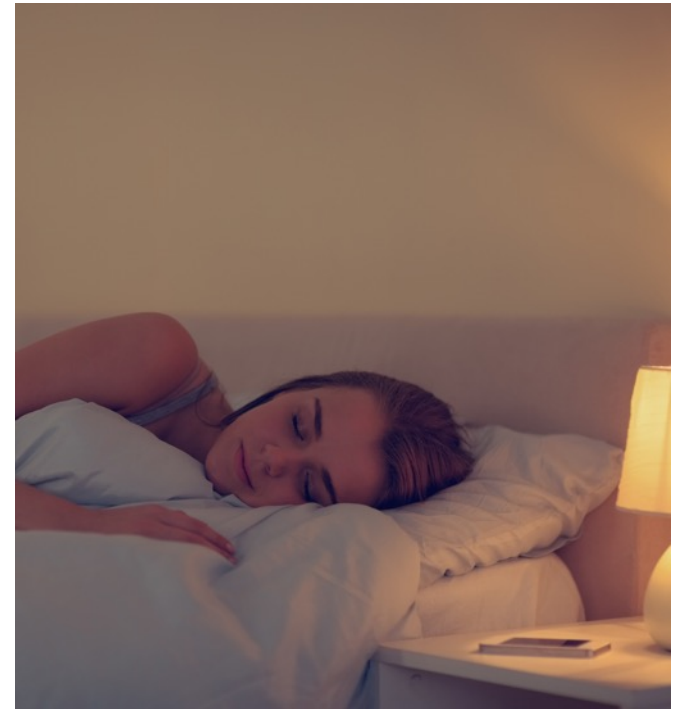
1. American Thoracic Society, Breathing in America: Diseases, Progress and Hope, <https://www.thoracic.org/patients/patient-resources/breathing-in-america/resources/chapter-23-sleep-disordered-breathing.pdf>
2. Peppard et al., Increasing prevalence of sleep-disordered breathing in adults, Am J Epidemiol (2013)
3. Frost & Sullivan, Hidden Health Crisis Costing America Billions, <https://aasm.org/resources/pdf/sleep-apnea-economic-crisis.pdf>
4. American Academy of Sleep Medicine, Severe obstructive sleep apnea hurts hearts, <https://aasm.org/severe-obstructive-sleep-apnea-hurts-hearts/>
5. Clinical Guidelines for the Use of Unattended Portable Monitors in the Diagnosis of Obstructive Sleep Apnea in Adult Patients, American Academy of Sleep Medicine

Convenient, at-home screening of obstructive sleep apnoea

- Using only a smartphone placed on the bedside table
 - Smartphone app uses audio signatures in overnight breathing and snoring sounds to identify sleep apnoea
- Excellent results from a 582 patient, double-blind, prospective clinical study compared to simultaneous in-laboratory PSG:

	AUC	Sensitivity	Specificity
AHI \geq 5/h (Mild)	0.90 (95%CI, 0.87-0.93)	84% (95%CI, 80-87%)	83% (95%CI, 69-92%)
AHI \geq 15/h (Moderate)	0.88 (95%CI, 0.85-0.91)	80% (95%CI, 75-84%)	80% (95%CI, 73-85%)
AHI \geq 30/h (Severe)	0.90 (95%CI, 0.87-0.93)	82% (95%CI, 76-87%)	82% (95%CI, 77-86%)

- Currently recruiting patients in an at-home study with simultaneous in-home AASM Type II PSG



Summary

- Revolutionary technology – diagnosis and management of respiratory disease without the need for additional hardware
- Compelling clinical evidence from two double-blind, prospective clinical studies
 - Double-blind, prospective adult study results due in Q1 CY2019
- Well understood regulatory pathway
 - CE Mark Technical File submitted in December 2018, TGA submission to follow successful CE Mark
 - Pre-Submission Meeting with FDA held in 2016, confirmed FDA De Novo pathway
 - FDA De Novo submission planned for Q1 CY2019
- Beginning to execute on commercial strategy with LOI signed for German hospital network pilot
- Broadened product portfolio
 - Chronic respiratory disease (asthma, COPD) management
 - Excellent results from double-blind, prospective obstructive sleep apnoea screening study
 - Partnership with Lockheed Martin on US DARPA WASH research program