



Narhex Life Sciences (ASX: NLS)
acquisition of
ResApp Diagnostics Pty Ltd

Diagnosis and management of respiratory disease using smartphones



March 2015

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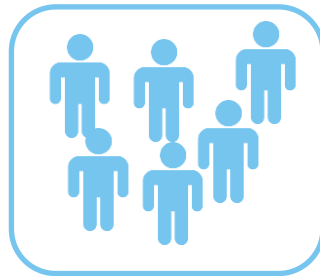
A unique opportunity in the next generation of mobile health

ResApp is developing the world's first clinically-tested, regulatory-approved respiratory diagnostic application for smart devices with no additional hardware required



**Next generation
mHealth**

*Anywhere, anytime
access to diagnosis and
management of
potentially life-
threatening diseases*



**Huge potential
market**

*Cough is the most
frequent illness-related
reason for visiting a
doctor¹*



**Fast to
market**

*mHealth infrastructure
and devices allow us to
deliver a medical device
quickly to the market*



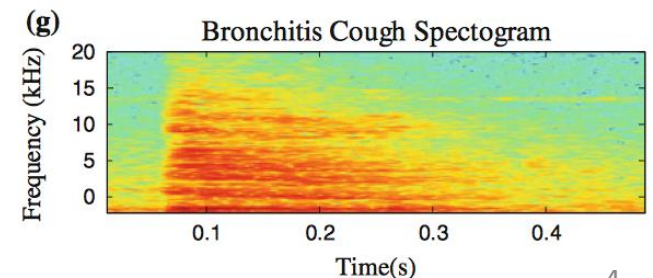
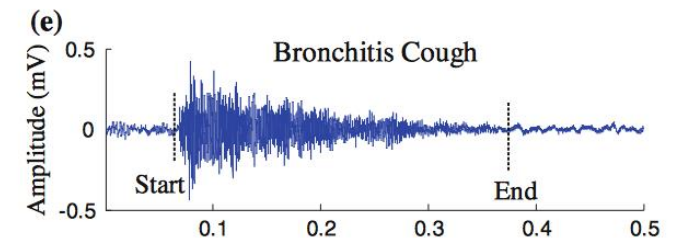
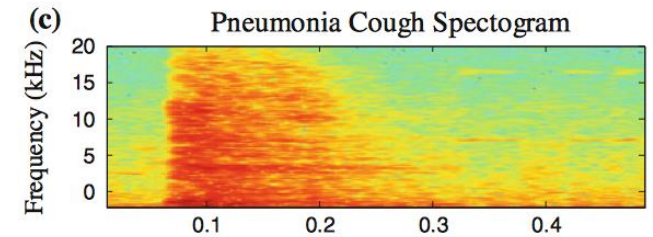
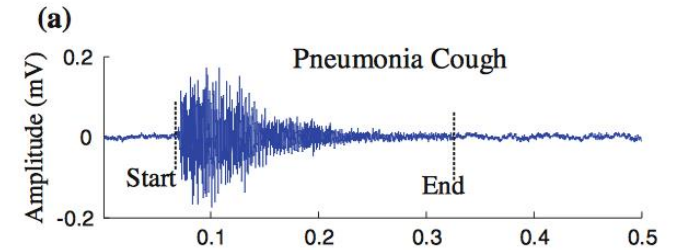
**Multiple revenue
streams**

*Direct to consumer as
well as licensing to large
established companies*

1. National Ambulatory Medical Care Survey 2010

Technology to revolutionise the diagnosis of respiratory disease

- ResApp has exclusively licensed technology developed by The University of Queensland
- Patent-pending differential diagnosis of respiratory disease using sound
- Able to run on multiple platforms: smartphone, over the web, wearables, medical devices
- Demonstrated to effectively separate wet from dry cough¹
- Proven to be effective for pneumonia and asthma in an initial clinical trial on children funded by the Bill and Melinda Gates Foundation²

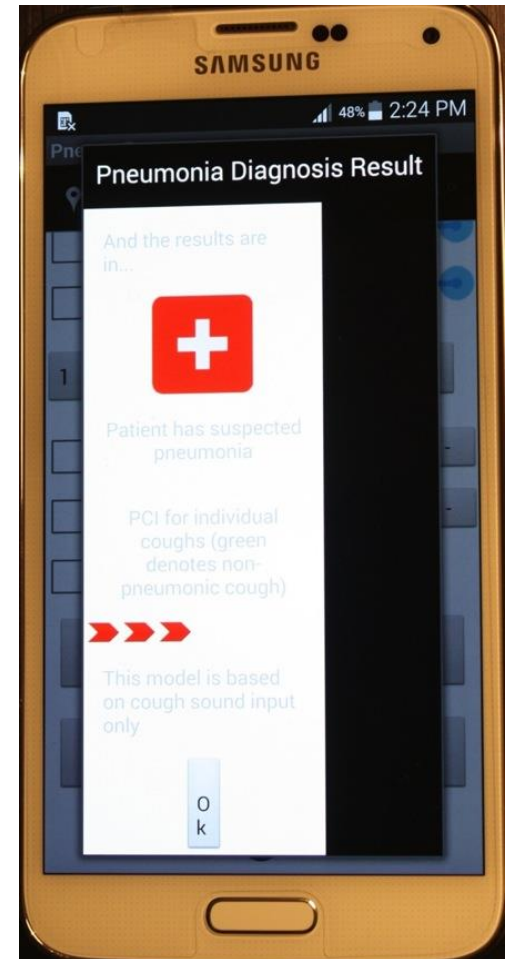


1. Swarnkar et al., Annals of Biomedical Engineering, 2013;
2. Abeyratne et al., Annals of Biomedical Engineering, 2013

Clinically-tested diagnostic via smartphone

- Simple to use, 5-11 coughs recorded by phone's in-built microphone
- Immediate diagnosis and suggested treatment pathway
- No additional hardware required, just an app download
- Leverage software platforms such as HealthKit and ResearchKit from Apple Inc.
- Prototype app for pneumonia and asthma built and tested on Android-based Samsung smartphone
- Potential extension to other respiratory diseases

Potential for even higher fidelity diagnosis and management using sensors available in wearables such as the Apple Watch.



Clinical proof of concept

Clinical proof of concept using funds from a Bill and Melinda Gates Foundation Grant¹ completed the following:

- Study run by The University of Queensland
- 91 patients, majority under the age of 5 (Sardjito Hospital, Indonesia)
- Microphones positioned above patient bed

Trial results:

	Sensitivity	Specificity	Accuracy	PPV	NPV
Pneumonia ²	94%	100%	96%	100%	89%
Asthma ³	100%	80%	90%	83.3%	100%

1. Peer reviewed study published in Abeyratne et al, Annals of Biomedical Engineering, 2013;

2. Differential diagnosis of pneumonia versus other conditions

3. Differential diagnosis of asthma versus pneumonia

Anywhere, anytime diagnosis and management of respiratory disease

Our vision is to empower consumers to self-diagnose and manage respiratory disease by providing effective, affordable and practical mHealth apps.

ResApp leverages the technology advances of mHealth to deliver a diagnostic test via an app directly to the patient prior to seeking a doctor's consultation



Cost savings for consumers, insurers and governments

- Reduced number of consultations
- Shorter consultation times
- Telehealth consultations
- Reduced misuse of antibiotics due to misdiagnosis¹

1. The cost of excessive antibiotics prescribed in the US is \$1B (IMS Institute for Healthcare Informatics, 2013)

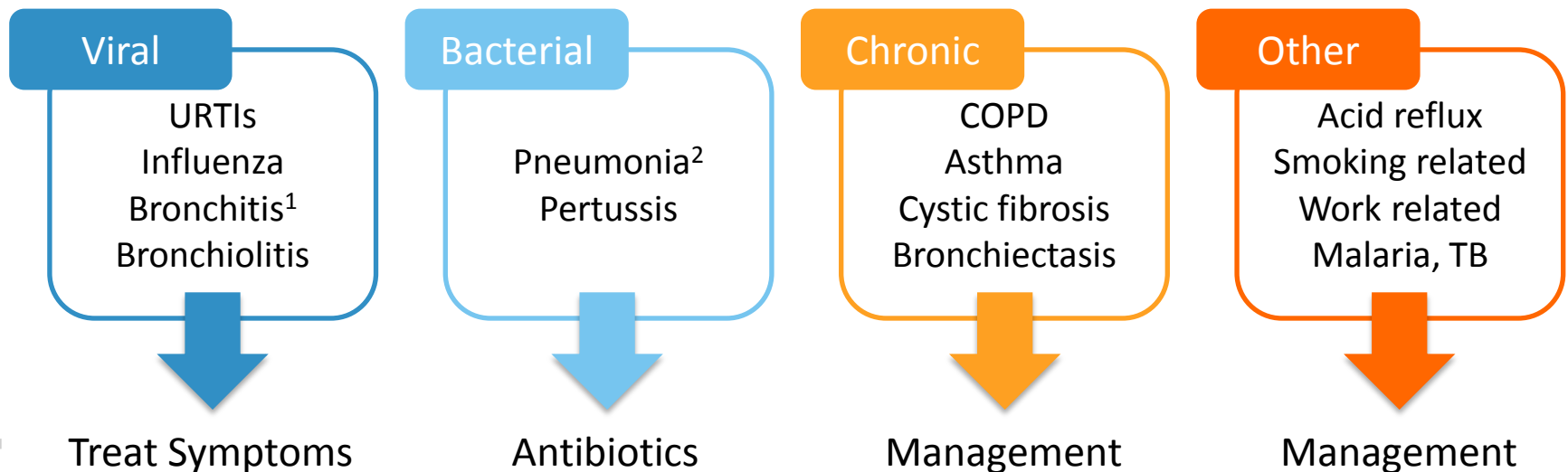
Diagnosis of respiratory disease is the most common outcome from a doctor visit

- Australia: 6-7M annual GP visits for respiratory disease¹
- US: 30M annual doctor visits for cough as only symptom, 101M doctor visits resulted in respiratory disease diagnosis²
- 1B people worldwide (15%) suffer from chronic respiratory or pulmonary disease³
- Multibillion dollar market for treatment;
 - \$2.3B US market for OTC cough and cold medicine⁴
 - \$29.4B global market for respiratory therapeutics⁵
- A significant market opportunity also exists in Asia where respiratory disease is highly prevalent, increasing in prevalence due to environmental issues and often misdiagnosed and mistreated
- In China, 1.3M new cases of chronic bronchitis and emphysema are diagnosed each year⁶, and rates of incidence of asthma have increased by 40% over the last 4 years⁷
- Globally, 15% of all deaths of children under 5 are caused by pneumonia, with high prevalence in South Asia and Sub-Saharan Africa⁸

1. Australian Lung Foundation; 2. National Ambulatory Medical Care Survey 2010; 3. Federation of International Respiratory Societies 2013; 4. IBIS World 2013; 5. GBI Research 2010; 6. "Toxic smog threatens millions of Chinese lives", The Telegraph, Feb 2014; 7. "China's Asthma Problem is Bad – and Growing Worse", The Atlantic, Jun 2013; 8. WHO

Differential diagnosis of cough is critical for performing the right treatment

Doctors are trained to try to diagnose respiratory diseases by listening to coughs (by ear and/or stethoscope)



“The diagnostic challenge for [the] clinician faced with acute or sub-acute cough is the identification of benign, self-limited episodes of mostly infection-associated cough versus severe, potentially life-threatening diseases as the underlying cause.”³

1. Bronchitis may be bacterial, but evidence (Smith et al, 2004) suggests antibiotics have limited benefits;
2. Pneumonia may be viral, but the majority of cases are bacterial; 3. De Blasio, et al, Cough, 2011

Strong growth in delivery of healthcare over the internet and mobile

- Significant advantages for patients, providers and payers
 - ✓ Lower costs
 - ✓ Improved quality of care
 - ✓ No travelling or waiting rooms
 - ✓ Shorter consultation times
- 82% of 18-34yrs who have a doctor say consultations over a mobile device are the best option for them¹

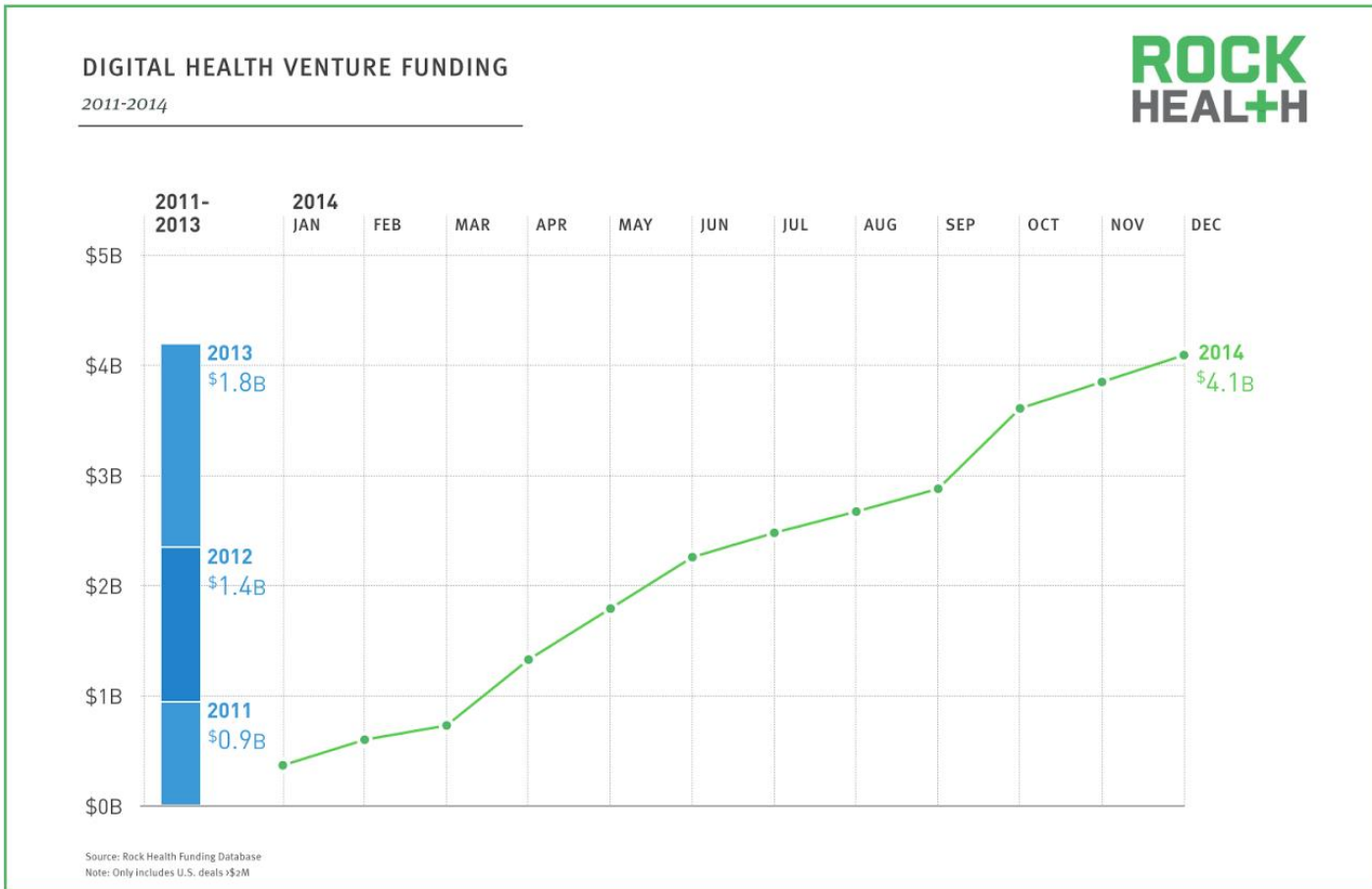


75M US telehealth consultations predicted for 2014²
1 in 6 US doctor visits were virtual in 2014²
US\$50-60B total addressable market²
56% CAGR predicted for US telehealth³

Most common telehealth visit is for respiratory disease (~31%)⁴

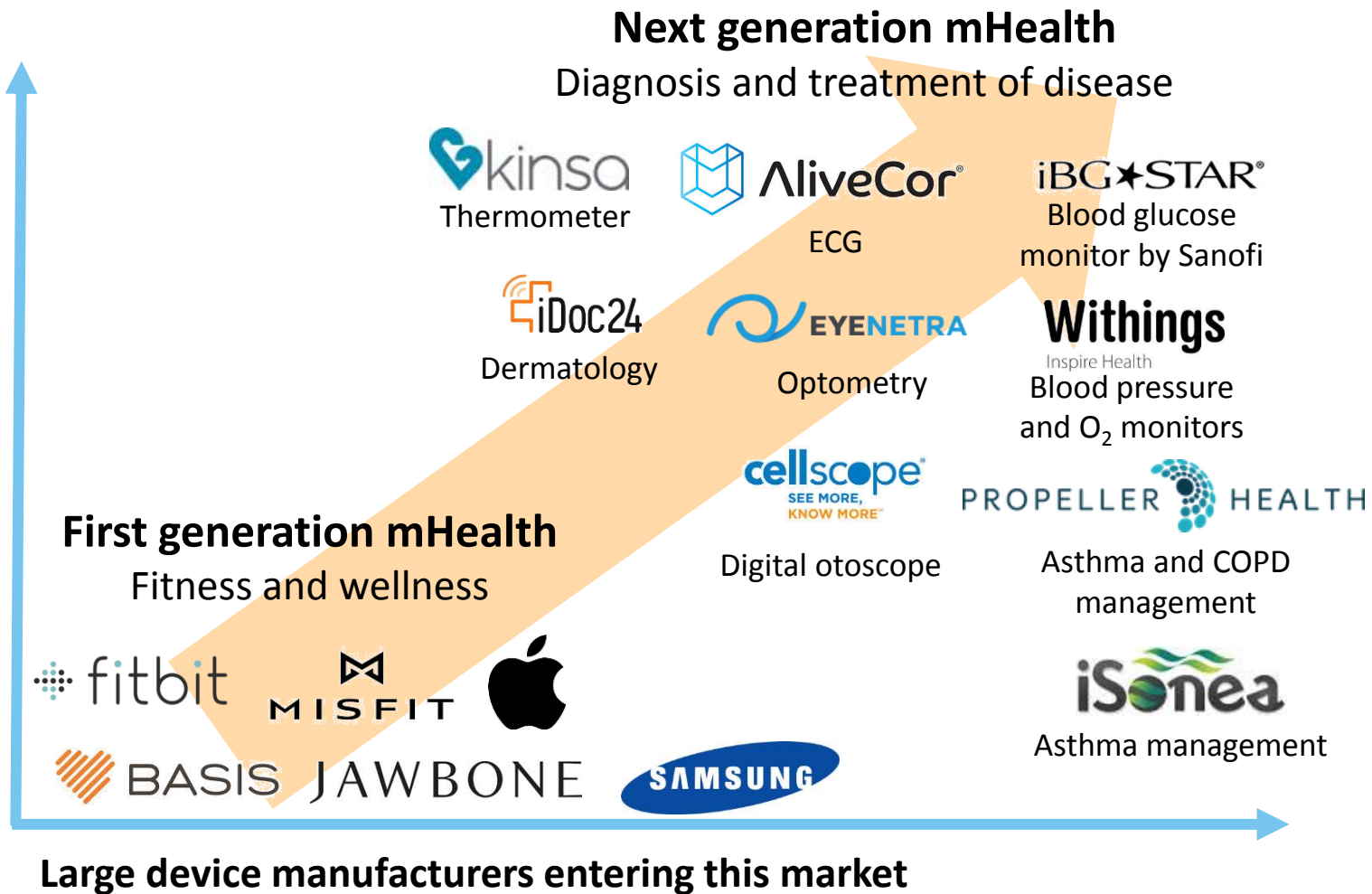
\$4.1B VC investment in digital health in 2014 (125% growth from 2013) \$312M into digital medical devices and \$285M into telemedicine

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mHealth is rapidly accelerating towards diagnosis and management of disease

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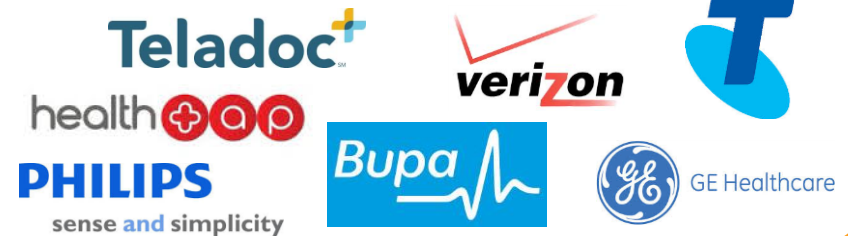
Multiple large revenue streams tied to real customer value

Direct sales to app users

- Direct to consumer distribution using Apple AppStore and Google Play
- In app purchase per diagnostic test (direct value to customer: cost savings due to no doctor visit, saves time and gives peace of mind)
- Provides immediate result and treatment options
- Repeated use to decide on further use of antibiotics (repeats)
- Repeated use by other family members
- Algorithm upgrades on additional disease states
- Partnering with treatment providers

Telehealth licensing

Licensing to large telehealth providers and technology providers for “in consultation” diagnosis over mobile or the web



Device licensing

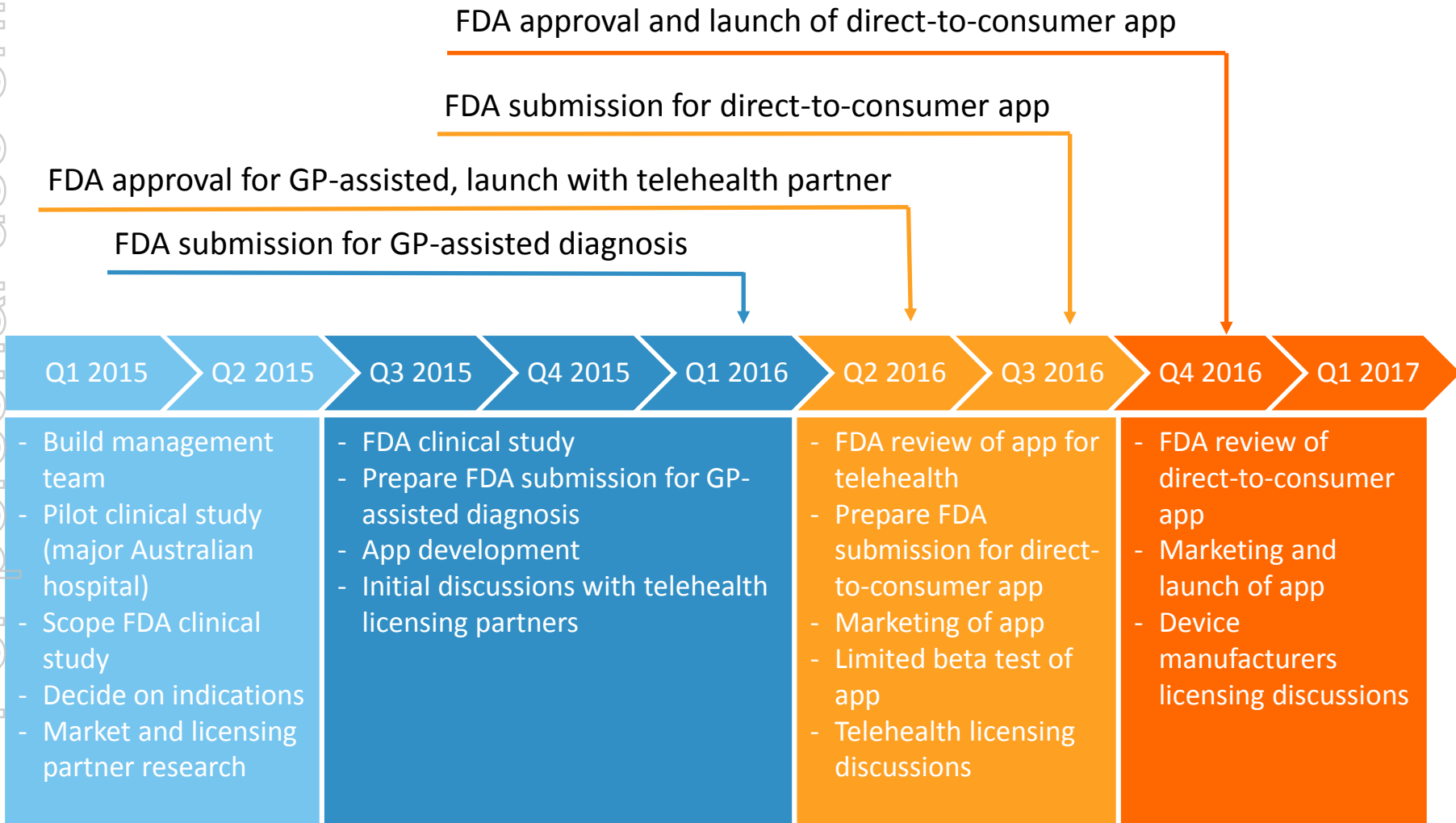
Licensing to mobile and wearable device manufacturers with large installed bases



ResApp has already received inbound interest from both device manufacturers and telehealth technology providers

Leveraging mHealth infrastructure and mobile devices to get diagnostic to market faster than traditional medical devices

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Diagnosis is just the beginning of the management of respiratory disease

ResApp has also licensed two technologies under development for the management of asthma and chronic obstructive pulmonary disease (COPD) using a smartphone with no additional hardware required.

Asthma management

2M people in Australia¹
25.5M people in US²

COPD management

1.2M people in Australia³
12.7M people in US⁴



Body contact hardware
sensor
(wheeze measurement)



Hardware device
attached to inhaler
(inhaler measurement)

- ✗ High retail price
- ✗ High barrier to purchase (order and shipping)
- ✗ Difficult to use (iSonea)

ResApp Health

App download only
(wheeze and beyond)

- ✓ Low cost
- ✓ Easy to purchase
- ✓ Pipeline of diagnosed users

1. Asthma Australia 2013; 2. CDC National Health Interview Survey 2012
3. Australian Lung Foundation; 4. American Lung Foundation

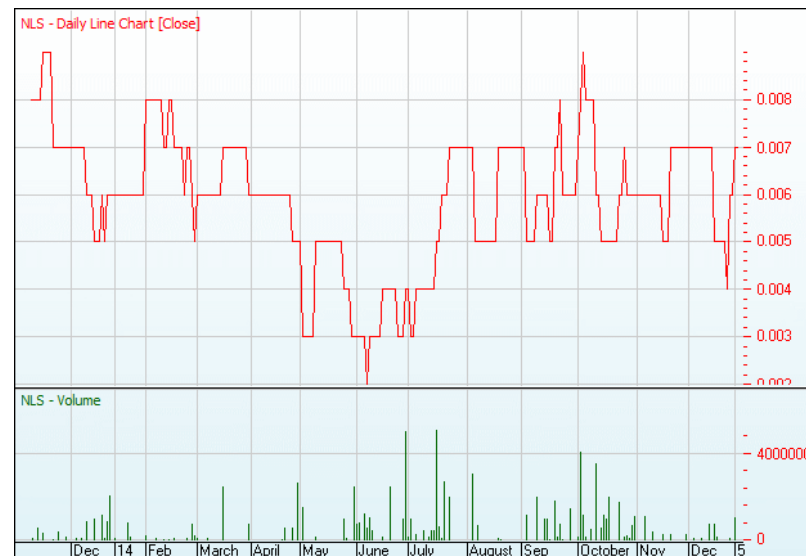
Moving quickly to completing clinical studies at major Australian hospitals and overseas

- ✓ \$900,000 placement completed
- ✓ Initial app developed for use in clinical studies
- ✓ Ethics approved for clinical study at a Perth hospital
 - Data gathering expected to begin week of 16th March 2015
 - Targeting 150 patients with a variety of respiratory conditions
 - Approximately 3 months for preliminary results
- ✓ Ethics applications underway for clinical study at second Perth hospital
- ✓ Discussions underway with a major humanitarian organisation to fund a trial in developing counties

Corporate Structure

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Corporate snapshot (4 Feb 2015)	Options ⁴	Shares (Pre-consolidation)
Share Price	-	\$0.007
12 Month Trading Range	-	\$0.002 - \$0.009
Current Cash Balance (13 Jan '15)	-	\$0.37m
Pre-placement Issued Capital	-	484.7m
Current Market Cap.	-	\$4.1m
Sophisticated Investor Placement ¹	90m	180m
Vendor Consideration	-	250m
Facilitation Fee	-	50m
Prospectus Re-compliance Raising ²	-	250m
Milestone Consideration ³	-	250m
Total Potential Issued Capital	90m	1,464.7m



Directors

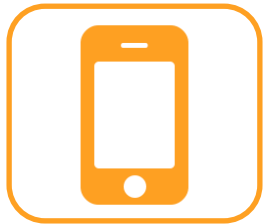
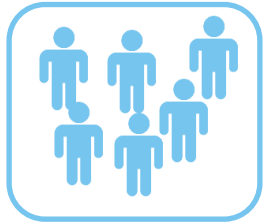
Adam Sierakowski

Chris Ntoumenopoulos

Rob Ramsay

1. \$900k sophisticated investor placement at \$0.005 per share as per the ASX announcements dated 2 October 2015 and 17 December 2015 to be completed.
2. Anticipate raising \$2.5m to raise sufficient funds to enable the re-compliance with Chapters 1 & 2 of the ASX Listing Rules.
3. To be issued upon ResApp or the Company achieving \$20m in gross revenues, or an acquisition event by NLS.
4. Exercise price \$0.01, Expiry 31 December 2016

An opportunity to be part of the next generation of mHealth and revolutionise respiratory disease diagnosis



- **Next generation mHealth**
 - Beyond fitness & wellness to diagnose and manage life-threatening respiratory diseases
- **Targeting consumer's visits to primary care**
 - Cough is the most common reason for visiting GP
- **Product launch within 18 months**
 - Leverage advances in mHealth and mobile devices to get diagnostic to market faster than traditional medical devices
- **Multiple large revenue streams directly related to value**
 - Leverage existing telehealth and device companies customers
 - Direct to consumer through Apple AppStore and Google Play

Additional Reference Material

- Queensland researchers create app to analyse your cough – Channel Nine News
 - <http://www.9news.com.au/national/2014/12/04/17/39/smartphone-app-to-diagnose-the-common-cough>
- The Future of Medicine Is in Your Smartphone – Wall St Journal
 - <http://www.wsj.com/articles/the-future-of-medicine-is-in-your-smartphone-1420828632>
- eVisits: the 21st century housecall – Deloitte
 - <http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/gx-tmt-2014prediction-evisits.pdf>
- Healthcare delivery of the future: How digital technology can bridge time and distance between clinicians and consumers – pwc
 - http://www.pwc.com/en_US/us/health-industries/top-health-industry-issues/assets/pwc-healthcare-delivery-of-the-future.pdf
- Young "Invincibles" Favor Mobile Healthcare – MDLIVE
 - https://www.mdlive.com/news/press_05142014b.html