



ResMed is disrupting connected health: Here's how

April 3, 2018 By Heather Thompson



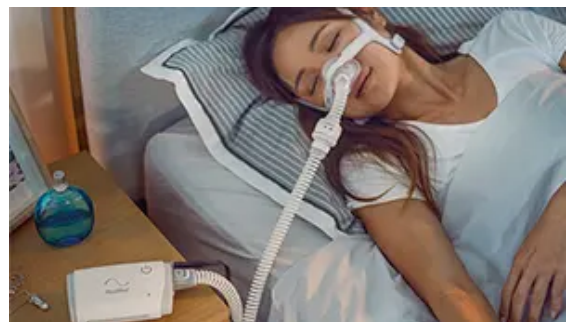
Here's how a respiratory firm took control of the connected health and the medtech digital revolution.

When you think powerful digital connected devices, the first thing to pop into your head probably isn't a CPAP. Continuous positive airway pressure has been shown in numerous studies to be effective in improving sleep apnea and preventing a host of co-morbidities such as obesity, congestive heart failure and chronic obstructive pulmonary disease. But the buy-in from patients is notoriously lacking.

Respiratory companies have been struggling with this challenge for many years. Designers and developers have made both iterative and innovative improvements, without demonstrably moving the needle on changing patient behavior. For the most part, compliance rates hover around 50%.

One company, **ResMed** (NYSE: **RMD**), has taken on the challenge of helping users become more compliant, the ecosystem more cost-effective and customers more loyal through a model of connected health.

San Diego-based ResMed's quest to improve patient compliance began over a decade ago, explained CEO Mick Farrell. "We started our first digital health experiments with UC San Diego in 2002 and learned a lot over a decade."



The AirMini, the smallest PAP available, was released by ResMed in 2017. [Image courtesy of ResMed]

That work led to a reinvention of the company in 2012, with 100% cloud-connected medical devices across all of its sleep apnea therapy platforms.

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"We're first in the industry to put a cellular communication chip inside every sleep apnea device," Farrell told ***Medical Design & Outsourcing***.

Since then, the company has made impressive strides. Berg Insight, an independent research organization, estimates that 7.1 million patients worldwide use remote monitoring products. Of those, more than 4 million are cloud-connected to ResMed's remote monitoring platform. In 2016, Berg noted in its "mHealth and Home Monitoring" report that sleep therapy remote monitoring grew by 70%, surpassing cardiac rhythm management. The report noted that the growth was "driven by the vendor ResMed that has made connected healthcare a cornerstone of its strategy."

That success changed the thinking around connected medical devices, blazing the trail for other medical device makers to follow.

Actionable insights

Farrell called out two key acquisitions that helped ResMed make the transition: Umbian, a digital health provider for sleep apnea management, in 2012; and Brightree, a provider of software-as-a-service for out-of-hospital care management, in 2016.

Their combined technology led to ResMed's release of the "world's largest remote patient monitoring network, AirView," said Farrell.

AirView captures nightly sleep data from more than 4 million sleep apnea and COPD patients via the cloud.

Umbian's U-Sleep features have helped improve the AirView offering by introducing "AirView Action Groups," in which patients are automatically grouped by therapy issue via smart algorithms, enabling clinicians to efficiently manage patients "by exception." Brightree helps customers improve both the clinical and business performances of sleep disorder devices.

Another part of Air Solutions is ResMed's patient engagement app, myAir, which scores sleep apnea patients on a scale of 100 based on how well they slept using CPAP therapy, plus personalized coaching to improve results. Worldwide, 1,300 new patients sign up for myAir every day, Farrell told us.

Each signup represents a paver on the road to Farrell's holy grail when it comes to data: actionable insights.

"Leveraging deep neural networks and sophisticated virtuous feedback loops of learning to discern actionable insights is the key to success," he explained. The AirView platform captures 1.5 billion nights of medical sleep and

respiratory care data, enabling analysis of large patient populations to glean insights that influence standards of care and patient outcomes.



Automatic user adoption

Although data collection alone would make ResMed a stand-out organization, there are tricky issues at play when it comes to gaining access to that data. That's where user-focused design comes into play.

According to designers specializing in patient behavior, the key to user adoption of connected devices is really not to give them an option. Bill Evans — founder and former innovation SVP at Bridge Design, a Ximedica company — noted that every moment a device maker puts a barrier in front of a patient presents a risk that the patient will abandon the device.

"We tell our customers, 'Don't make it hard to get in the cloud, meet your users where they are, not where you want them to be,'" Evans told us.

ResMed took this lesson to heart.

"You lose health adopters every time you ask a patient or provider to perform a set-up step, select a network or flip a switch," Farrell agreed. "You're asking them to do something before they see the value. We flip that around and only ask them to do something after we've generated the value for them. We took all the work out of it."

Every Air Solutions device is cloud-connected out of the box. Data from the cloud can be seen the next morning by the patient or (with the patient's permission) a doctor, enabling the monitoring and support of patients without an office visit.

"All the patient has to do is go to sleep," Farrell said.

"[ResMed] has thrown every best design practice in the book" at helping patients get connected with their medtech devices, Evans said.

And it appears to work. A November 2017 study of 128,000 patients published in the journal CHEST showed that sleep apnea therapy users whose nightly use was remotely and self-monitored via ResMed's AirView and myAir platforms, respectively, were more than 87% adherent on therapy.

A three-legged stool

Evans and other device developers often talk about three-legged stools when discussing what makes a product successful: Cost, outcomes and loyalty. The decisions ResMed made on how to best collect, store and share data with patients and caregivers led to better outcomes. And patients get immediate feedback from their device,

including prompts to order new supplies or replace parts and assessments of sleep improvement. All that helps build loyalty.

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The third leg is cost, and that's where ResMed solves one of the stickiest issues in the medtech space: Reimbursement.

Although every payer is different, all want proof of compliance. For example, Medicare requires that a patient use CPAP for more than four hours per night on 70% of nights during a 30-day consecutive period during the first three months of use. Farrell said myAir and AirView improved that number to 87%.

A connected future

ResMed has plans to expand its connected health solutions worldwide, leveraging data for actionable insights and, according to Farrell, "exploring ways where all this smart data can take us next" — particularly when it comes to using artificial intelligence models through machine learning and predictive models.

And the CEO has his eye on therapeutic areas beyond sleep apnea and COPD; he's asked his team to consider possible applications in cardiovascular disease, Type II diabetes and other severe chronic diseases.

Nick Vassilakis, founder & CEO of remote patient monitoring company Astute, noted that integration of sensors and data into a unified platform, "to get a more holistic view of a patient's overall wellness," is a significant challenge.

Farrell understands that realizing his vision will require an entire ecosystem, with the pharma, medtech and software industries combining to "bend the rising healthcare cost curve together."

"Everyone wants healthcare data streamlined and in one spot," he said, and he sees ResMed playing a role by giving patients a single app for sleep, exercise and nutrition.

"We see big tech companies like Apple creating consumer facing health applications and Google/Verily looking to create an ecosystem. Most recently we have seen Amazon talking about getting into the delivery space," he explained.

ResMed's Air10 sleep apnea devices and Astral and Stellar in-home ventilators can already connect to the devices' built-in cloud connection, he added, noting that the company plans next to connect its portable oxygen concentrators to the cloud. And although Farrell wasn't willing to discuss his plans beyond that, it's clear that ResMed plans to continue to lead the connected space.

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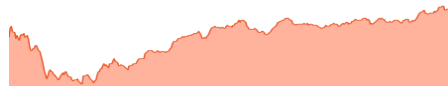
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