

# CUSTOMISED INFUSION PUMPS: THE FUTURE OF SELF-ADMINISTRATION?

In this article, Shaul Eitan, Chief Executive Officer, Avoset Health, explores the challenges of home infusion and examines how customisation and connectivity could help provide a solution.

Infusion self-administration at home has emerged as an important option for improving patient satisfaction and reducing the strain on overcrowded hospitals. However, our current approach has also missed opportunities to achieve significant improvement in the level of home care that the medical industry can provide. If we expand our mindset regarding home infusion to include other trends in the industry – such as patient engagement, connectivity and big data – patients, clinicians and the pharmaceutical industry could all stand to benefit.

## PROBLEM: COMPATIBILITY AND COMPLIANCE

There are two essential challenges when it comes to home infusion solutions – compatibility and compliance. The issue of drug compatibility is the burden of pharma companies that are developing new specialised drugs for advanced treatments. Some of these drugs face major hurdles to be infused in hospital, let alone at home, due to a drug's make-up and its reaction to environmental conditions. As such, pharma companies developing these speciality drugs with specific compatibility requirements must find customised infusion solutions that can protect and deliver the drug without harming its integrity.

The other challenge – compliance – is the burden of the patient. We know that, for a number of reasons, patients struggle to administer medicine correctly, creating risks during home infusion therapies.<sup>1</sup> Even when a patient is doing their best to follow the doctor's orders, they may still encounter issues such as line complications and adverse reactions to medication. The urgency of this problem increases when considering that doctors rely on patient self-reporting to track infusion compliance and to know whether to continue treatment. It should be concerning to anyone working in the field that around 20% of home infusion patients end up back in hospital at least in part due to misuse of their infusion device.<sup>2</sup>

“There are two essential challenges when it comes to home infusion solutions.”

Existing home infusion devices only partially address these two issues. While they ensure that many different drugs are compatible, they fail to meet the needs of more specialised medicines, which are becoming more common. As such, the number of drugs deliverable through home infusion is limited.

Furthermore, in device manufacturers' pursuit of widespread compatibility, infusion devices include many options that are irrelevant for a given patient. Patients are forced to either receive help from a healthcare professional or to navigate the adjustments themselves. Each complicating factor increases the chances of a patient not complying with infusion instructions.

Compliance, for the reasons mentioned above, is also a major challenge for the home infusion industry. Devices have no method of providing information about compliance and are therefore creating a gap in which patients can be harmed by home infusion treatments.

Despite great advances, the current approach to home infusion is lacking.

With two steps we can significantly improve home infusion and, in doing so, create value for doctors, patients and pharma companies.

## SOLUTION 1: CUSTOMISATION

Firstly, more infusion pumps should be customised for specific drugs. Customised pumps would create efficient solutions for more complex drugs with high rates of usage or complex make-ups – and for the specific needs of different patient populations.



**Shaul Eitan**  
Chief Executive Officer  
T: +1 877 541 9944  
E: shaul.eitan@avosethealth.com

**Avoset Health**  
29 Yad Haruzim St  
PO Box 8639  
Netanya 4250529  
Israel

[www.avoset.com](http://www.avoset.com)

“A customised pump can help extend the lifecycle of a drug and provide differentiation in crowded markets.”

Customised pumps would be simpler, allowing a patient to receive the drug and device, hook it up and begin, without having to sift through the many options that come with general infusion pumps. Likely, this would reduce adverse drug events caused by patient confusion related to a doctor’s orders or device set-up. And the healthcare industry could save on the labour costs involved in sending medical professionals to patients’ homes repeatedly to set up and troubleshoot the pumps.

Additionally, orphan drugs – which may not be considered in the design of a general pump – would also be able to more easily enter the infusion market with an available customised pump. Currently, 500 orphan drugs exist in the US where the FDA has increased the drug approval rate in recent years – with almost 50% of approved drugs from 2000–2017 having been approved after 2013.<sup>3</sup> Infusion options should be readily available for these treatments just as they are for more common treatments.

A customised pump can also help extend the lifecycle of a drug and provide differentiation in crowded markets. Assuming the price point is the same, there is little doubt that patients and medical professionals would prefer a drug that comes with a plug-and-play pump as opposed to one that involves a general infusion approach.

## SOLUTION 2: CONNECTIVITY

Beyond customisation, infusion pumps should be connected to the cloud – allowing for data analysis and integration with platforms. Connected pumps would provide massive benefits for the pharma industry, doctors and patients. At the most basic level, connected pumps would allow the industry to get clear data on infusion for the first time. We need these numbers to accurately approach infusion treatments away from hospitals.

Connected devices would also provide pharma companies with a simple way of conducting post-market surveillance to discover new indications and side effects. It would allow for HIPAA-compliant tracking of each individual’s basic data and the side effects, indications and other important data points that the patient is experiencing. That data can then be used to enhance the lifecycle management of a given drug significantly.

Pharma companies could also use connected devices to enter into outcome-based payment contracts more easily by confirming patient engagement. Currently, many US states allow for deals with companies in which they promise reimbursement if the drug fails to work for a patient. However, there is no way to know if the patient used the drug correctly.

We do know that some drugs, such as antibiotics, are often thought to be ineffective when, in fact, they are inappropriately administered. Outcomes-based payment contracts would increase revenue from any truly effective drug and improve the standard of care for patients.

In addition to the benefits to pharma companies, connected devices would allow for the integration of apps into home infusion care. An app on a patient’s device could remind them of their next scheduled infusion, provide them with ways to record their recovery, and give them the ability to receive feedback and support from their doctors or even the manufacturer of the drug. Loved ones could track the treatment as well and assist in the therapy to ensure it goes as planned.

## NEW HORIZONS IN INFUSION CARE

Perhaps the greatest advantage of creating customised and connected pumps would be the expansion of the range of drugs that is safe for home care. An exciting example of this would be more patients undergoing chemotherapy from the comfort of their home. As chemo is already a stressful and uncomfortable process, allowing patients to be in a more relaxed environment could greatly improve their treatment. However, this can only be made possible by a

“The greatest advantage of creating customised and connected pumps would be the expansion of the range of drugs that is safe for home care. An exciting example of this would be more patients undergoing chemotherapy from the comfort of their home.”



**IN WHICH ISSUE SHOULD  
YOUR COMPANY APPEAR?**

[www.ondrugdelivery.com](http://www.ondrugdelivery.com)

device that is simple to use and which can communicate with the patient's doctor to ensure safe and comfortable use of the drug.

We have seen early examples of simple customised wearable infusion devices that help patients leave hospital earlier after a chemo treatment to continue at home. With connectivity, this model could be significantly expanded.

Home infusion is an important advancement in healthcare but it must be customised and connected in order to be fully leveraged to support the various players in the system. Patients would receive simple-to-use pumps that integrate with their smartphones to improve user experience and compliance. Doctors would be able to send more patients home – reducing the burden on hospitals. Pharma companies would be able to increase the number of drugs offered for home infusion and use post-market surveillance to improve those drugs after release. Home infusion is another segment of the healthcare industry that is set to be improved by the integration of customisation and connectivity.

#### ABOUT THE COMPANY

Avoset Health is a medical device company focused on providing solutions across the spectrum of home infusion including the development and manufacturing of connected home infusion devices, fleet tracking, caregiver-patient interactions and streamlining pharmacy workflow. One of three privately held companies operating under the Eitan Group, Avoset leverages core capabilities and expertise in drug delivery technology development, manufacturing and regulatory experience to offer a robust platform solution meeting the needs of the home infusion industry. By developing a connected and easy-to-use platform Avoset is reducing hospital readmissions, encouraging accurate data collection, easing workflows and bringing infusion care home.

#### REFERENCES

1. *Scarlett W et al, "Medical Noncompliance: The Most Ignored National Epidemic". J Am*

*Osteopath Assoc, 2016, Vol 116, pp 554–555.*

2. *Huang V et al, "Risk factors for readmission in patients discharged with outpatient parenteral antimicrobial therapy: a retrospective cohort study". BMC Pharmacology & Toxicology, 2018, Vol 19.*
3. *Aitken M, Kleinrock M, "Orphan Drugs in the United States (Part One), Growth Trends in Rare Disease Treatments". Research Report, IQVIA Institute for Human Data Science, October 17, 2018.*

#### ABOUT THE AUTHOR

**Shaul Eitan** is the Chief Executive Officer of Avoset Health and previously served as COO of Q Core Medical, a developer of smart infusion systems for hospital and ambulatory care settings.



## Medical Technology Ireland

25-26 September 2019, Galway Racecourse

Showcasing innovative medical technology products and solutions for the Irish medical device design and manufacturing industry.

**Start-up  
& Innovation  
Academy**

**Women  
in MedTech  
Forum**

**200+  
global  
suppliers**

**Unmissable  
FREE Two-day  
Conference**

**Exclusive  
Meetings Programme  
for visitors and  
exhibitors**

Register NOW for your FREE entry pass at [www.medicaltechnologyireland.com](http://www.medicaltechnologyireland.com)

If you are interested in exhibiting, contact [jason.moss@medicaltechnologyireland.com](mailto:jason.moss@medicaltechnologyireland.com)