



# Saving Lives by Revolutionising Pre-Hospital Emergency Oxygen Delivery



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# Oxygen is the most commonly used drug in emergency medicine

But getting oxygen to patients with acute breathlessness quickly and easily is a major challenge for EMS services and militaries globally

**34% of all ambulance patients receive oxygen during transit, but:**

- ⊗ Medical grade free-flowing oxygen cylinders are cumbersome, heavy, difficult to move and require significant infrastructure to store and transport.
- ⊗ Existing oxygen delivery systems use a significant amount of oxygen, requiring multiple cylinders which are impractical to deploy in the field where often needed.
- ⊗ Growing demand for oxygen (particularly during the pandemic) has strained supply chains, increased costs and demonstrated a lack of resiliency.

**The medical oxygen market needs a device that is smaller, dramatically more efficient and more easily deployed in the field in emergencies.**

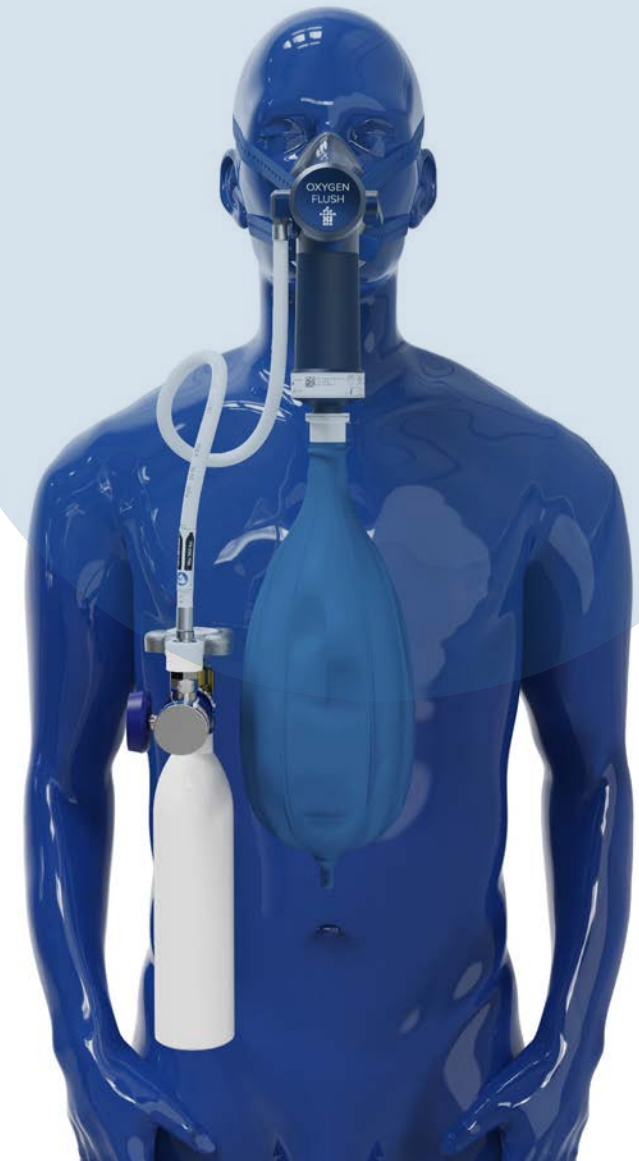
**Sources:** Binita Kane, Samantha Decalmer, B. Ronan O'Driscoll. "Emergency oxygen therapy: from guideline to implementation. Original reference: Hale KE, Gavin C, O'Driscoll BR. Audit of oxygen use in emergency ambulances and in a hospital emergency department." *Emerg Med J* 2008; 25: 773–776. and O'Driscoll BR, Howard LS, Bucknall C, et al. *British Thoracic Society emergency oxygen audits.* *Thorax* 2011; 66: 734–735.



## Our patented FIDO device will become the new global standard in pre-hospital oxygen treatment

Mirola Rescue AB. is a Sweden-based MedTech R&D firm founded in 2016. We've developed FIDO: a closed circuit oxygen rebreathing device for acute, in-field oxygen treatment that will replace old, cumbersome free-flowing oxygen systems with large cylinders.

- ✓ Weighing only 1.5 kg, FIDO is perfect for use in-field, prior to hospital admission for patients with acute breathlessness.
- ✓ Our patented Mair re-breathing technology delivers 60 minutes of oxygen with only a 0.4-litre cylinder (versus conventional 5-litre or 10-litre systems).
- ✓ FIDO is built for the most demanding situations and can be deployed in less than 30 seconds in virtually any environment.
- ✓ FIDO is patented, medically certified (CE IIA), operates to ISO 13485 standards and the cylinder is approved for air transport



# FIDO is revolutionary: it's portable, and simple to use anywhere in 30 seconds

FIDO will save lives by enabling first responders to administer oxygen in-field within seconds.

We offer dramatically better performance versus the legacy free flow oxygen systems currently used:

	<b>FIDO</b>	<b>EXISTING FREE FLOW SYSTEMS</b>
Total Weight:	<b>1.5 kg</b> △	15 kg
40cl Oxygen Cylinders Needed for 60 Minutes:	<b>1</b> △	20
Oxygen Concentration:	<b>52% - 89%</b> △	30% to 72%
Air Temperature:	<b>Warm (33°C)</b> △	Cold
Free-Oxygen Consumption:	<b>Low</b> △	Very High
Reuses Exhaled Air:	<b>Yes</b> △	No
Patients Who Can be Treated from 1x8 Litre Bottle	<b>20</b> △	1





# FIDO is built for demanding military, medical and rescue environments

We solve the challenges that EMS first responders face with conventional free flow oxygen systems:

## Military

Special forces, field-hospitals, aircraft, battlefield medic kits, naval ships & battlefield vehicles.

### CHALLENGE

Carrying large oxygen cylinders is impractical and delays life-saving oxygen in battlefield trauma situations, pre-admission to hospital.

### WHY FIDO

- ▷ FIDO enables patient oxygen delivery wherever it is needed, within seconds.
- ▷ FIDO can be carried easily in any vehicle or in an EMS medics kit bag to support patients during transport.

## Rescue

Fire, marine rescue, dive-sites, mountain rescue and EMS services.

### CHALLENGE

Carrying bulky oxygen cylinders can be difficult, dangerous and is often overlooked by EMS rescue medics, to create a barrier to treating acute breathlessness pre-admission to hospital.

### WHY FIDO

- ▷ FIDO is lighter and practical to carry as standard medic kit.
- ▷ Much less compressed oxygen is required, improving safety in challenging environments (i.e., aircraft).

## Medical

Paramedic / EMS medic kits, ambulances, nursing homes, emergency rooms and medical settings.

### CHALLENGE

Oxygen cylinders take up too much space; are inflexible; expensive to maintain and subject to supply chain disruption. This is a challenge for treating asthma, pneumonia, ventricle failure, heart failure & pulmonary embolisms in pre and post hospital admission emergencies.

### WHY FIDO

- ▷ FIDO is smaller, simpler to operate (with less infrastructure) and easier to maintain in ambulances and medical settings.
- ▷ FIDO requires dramatically less oxygen, reducing supply chain reliance.
- ▷ Patients get oxygen faster and breath warm air (vs. harsh cold air).

# FIDO is already on the ground with demanding users around the world

Users love how simple FIDO is to use in previously very challenging environments:



Very easy to use, it is very well tolerated by the patient. It is useful in all emergency situations where weight/volume constraints are important: itinerant rescue, helicopter rescue and winching, confined space (caving, urban search and rescue, mountain rescue, etc.). Its small size allows the essential resource of oxygen to be brought to the victim, from the early beginning of the intervention.”

**Dr Xavier Attrait**

Emergency Physician, Former Military Doctor (19 years)

## EXISTING CLIENTS INCLUDE



# The pandemic and concern over growing medical costs have created an opportunity for innovation in the market

1 Covid has put a spotlight on technology that effectively addresses acute breathlessness:

“Covid-19: Oxygen shortages two years into pandemic highlight pre-covid failures, says WHO”



“Ambulance crews running out of oxygen amid supply problems”



- ▶ In the short-term, supply chain challenges continue to plague the oxygen industry, with shortages continuing now.
- ▶ In the medium and long-term, the global healthcare industry is more aware of the shortcomings of traditional free flowing oxygen delivery systems, creating an appetite to test new solutions.

2 Rising healthcare costs are outpacing GDP growth in most countries, creating pressure to cut costs

“Consumer prices are rising fast, and healthcare isn’t far behind”



- ▶ Technology that can deliver operational efficiencies through innovation like FIDO will become more attractive for procurement.
- ▶ The cost, complexity and space required to manage a constant throughput of large (5 litre – 10 litre OXYGEN cylinders) will come under increasing scrutiny.

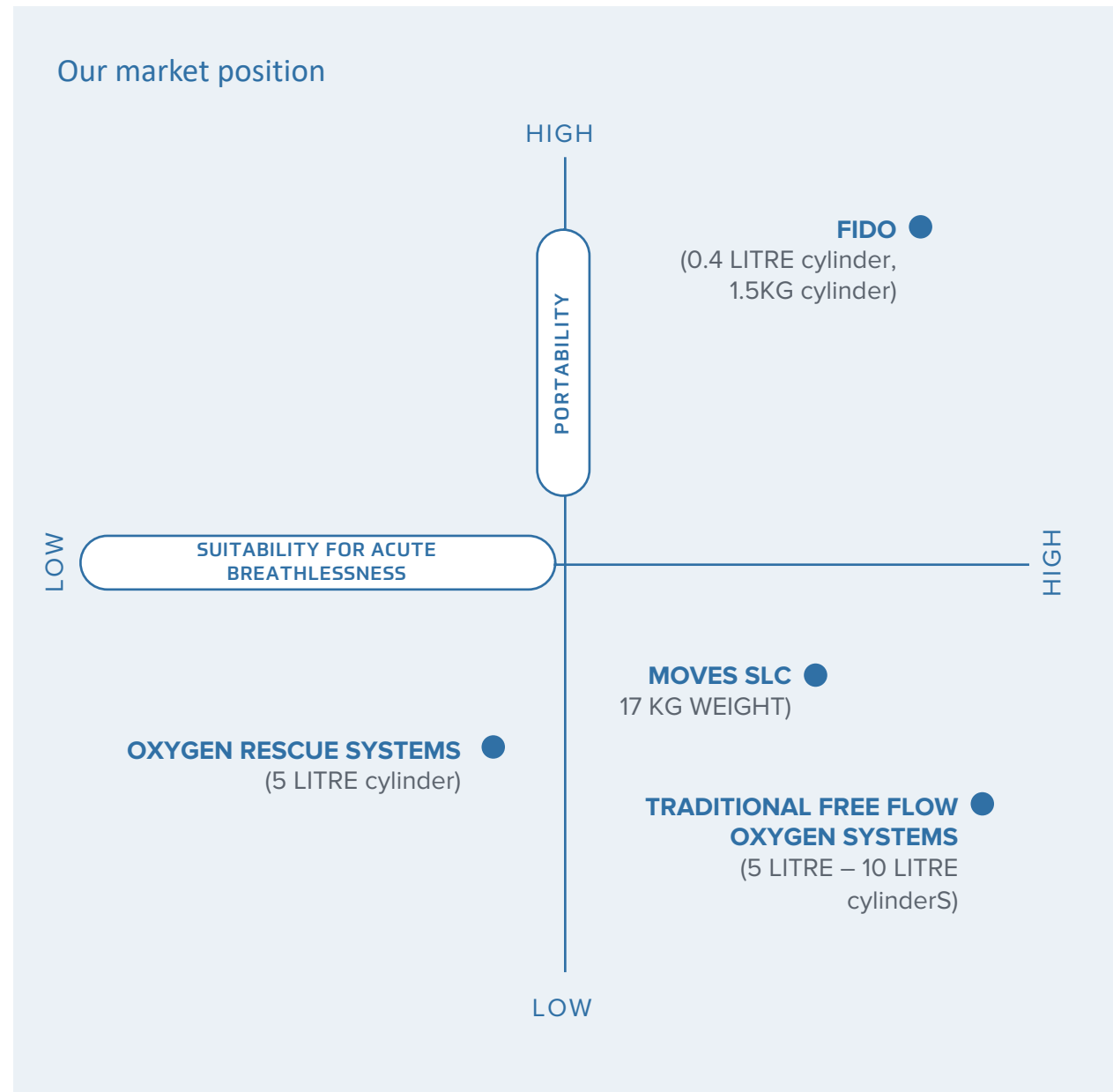
# No competing technology comes close to matching the uniqueness of FIDO

## The market for free-flow oxygen is fragmented:

- ▷ Distributors supply fixed-location, free flow oxygen systems, typically comprised of parts from a patchwork of manufacturers and are focused on ambulance and post-admission hospital applications.
- ▷ Virtually no competitor offers a portable solution that can be deployed easily in a pre-hospital environment and meets the needs of militaries and rescue teams.

## FIDO is a unique proposition, addressing military, rescue and medical missions that no other technology can:

- ▷ FIDO is a complete all-in-one branded system that delivers better performance and requires dramatically less oxygen than free flow systems, which are often impractical pre-hospital.
- ▷ FIDO is a significantly smaller platform that can be easily carried and deployed anywhere in less than 30 seconds.
- ▷ FIDO offers better performance (oxygen concentration, air temperature, number of patients supported etc) than free flow oxygen systems.







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