

The Challenge

During the pandemic, oxygen supply was an even more critical service than usual across the NHS, with supply within A&E, acute wards, ambulatory and community care being unimaginably stretched. Cylinder supply was constrained globally, exacerbated by the fact that if existing cylinders could not be found, they couldn't be replenished.

Cwm Taf Morgannwg University Health Board's key challenge was to understand the location and usability status of cylinders across hospital sites – a traditionally manual, labour-intensive, and timely process. Considering the added pressures throughout the pandemic, there was a critical need to address this problem quickly. Cwm Taf Morgannwg UHB challenged Kinsetsu to provide a cylinder locating solution across both the Royal Glamorgan and Princess of Wales hospitals.

The Solution

Kinsetsu worked alongside key stakeholders at Cwm Taf Morgannwg (including R&D Lead Pharmacists, Clinical Procurement Leads, Clinical Engineering, Nursing and Porter teams) to create a solution that leveraged their existing intelligent tracking architecture, supplementing that investment with sensors to understand location awareness of cylinders within the estate.

The solution's sustainability was paramount, instead of using throw-away RFID tags we selected durable and reusable plastic tags that could be re-coded for new cylinders, and provided an environmentally friendly method of attaching the tags to the cylinders.

The project was delivered across numerous phases, with initial meetings focused on requirements analysis and project definition, delivered in accordance with PRINCE2 guidelines. These meetings were scheduled weekly during the initial phases to include all key customer stakeholders. Once restrictions allowed, we delivered in-person end user training and final solution testing.

At all times through the solution phase, Kinsetsu focused on 4 key deliverables:

1) Immediate insight to the location of oxygen cylinders across two sites.

2) Immediate insight to the status of cylinders (validation that oxygen within the cylinder was within service-use-by date).

3) Ensuring cylinders were delivered to the right location to enable supply replenishment.

4) Delivering an intuitive interface for staff with varying levels of IT experience.

The Outcome

Empowering pharmacy, nursing and porter teams to locate cylinders within seconds has been ground-breaking. Instantly visualising where cylinders are on meaningful digital maps, combined with analytics highlighting how long cylinders have been in a location and where oxygen is approaching its use-by-date, has enhanced the service availability and greatly reduced risks of lack of supply.

"The Kinsetsu team engaged with various stakeholders within the board and created a solution that was innovative, easy to use and transformative to provide insights to the location awareness and usability of our oxygen cylinders via a sustainable sensor and their IoT platform.

At a glance, I can see the location of cylinders and traceability of their journey. Additionally, I can identify what cylinder is due to expire and its last known location. Having this information helps us manage supply and reduce risk, seamlessly, which is important particularly as we are now managing various logistical and supply issues remotely.

Our medical gas contract supplier has currently been in operation for 9 years. Over this period, there were many cylinders that could not be found. To write-off the expired cylinders was an approximate one off cost of £45,000. The alternative was to keep paying for the 'misplaced cylinders' at a cost of £16,000 per annum for rental.... The problem was firmly with the Health Board.

The comparison for new solution for 3 years with Kinsetsu to manage 1000 cylinders was £46,320. The cost of paying for the 'misplaced cylinders' and an asset we couldn't find was £48,000. Note, this was only the cost of the 'misplaced cylinders', not the entire service. The numbers stacked up."

**John Harris, R&D Lead Pharmacist and Clinical Procurement Lead
Cwm Taf Morgannwg University Health Board**

