

## AN INNOVATION CASE STUDY

### DEVELOPMENT OF AN ADVANCED DIGITAL AND PHYSICAL ENGINEERING (ADPE) HUB

**PROJECT DURATION:** 24 months

**PARTNERS:** Softgel Solutions Ltd, Innotech Engineering, Cardiff University, and Cwm Taf Morgannwg University Health Board

**PROJECT AIM:** To facilitate the ongoing development of an innovative, digital and physical engineering hub designed to engage and meet changing demands

## OVERVIEW

The COVID-19 crisis has highlighted the need to be able react to two issues;

- The repurposing of equipment shelved in stores, deemed out of order due to lack of parts from suppliers, and,
- Opportunities to prototype innovative ideas.

To facilitate this, there has been an opportunity to build on initial, innovative work establishing an Advanced Digital and Physical Engineering (ADPE) Hub at the Prince Charles Hospital. This hub arose from the repurposing of the Maxillofacial-Dental laboratory and its 3D printing capabilities; its creation being to accelerate the impact of game changing, innovative ideas.

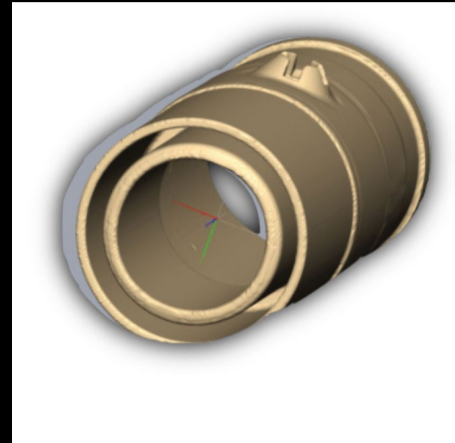
The hub will bring together, and provide a platform for, staff, patients, academics and industry partners to engage in an innovative way of working, by providing an autonomous and rapid mechanism to respond and enable practical solutions to issues.

Without industry involvement, Health Boards do not have access to the equipment, skills or experience to develop this concept. Due to a number of operational, regulatory and practical reasons, external sourcing or off-site engagement has proved too difficult.

Bringing industry capability on board as partners, within a designated working space will enable health boards to rapidly prototype and test ideas, eliminating risk, reducing experimental stages and utilising industry partner know how to scale up production of best solutions.

The COVID-19 emergency has put NHS Wales under real pressure, the success of this project would enable a successful initiative to emerge from it, providing a positive outcome that will increase the resilience of the NHS in the future.

**Accelerate** is supporting the ongoing development of this innovation hub, by providing academic expertise and by facilitating the expansion of its 3D printing capabilities.



**3D printed exhalation ports**  
An example of repurposing equipment to meet new demands



## EXPECTED OUTCOMES

- Development of a central digital and physical engineering capability that can engage with staff across the Health Board
- A new pathway to facilitate innovative solutions
- Health Economic cost analysis
- The expansion of a new spin out company (Innotech Engineering)
- Established links and joined up working with industrial, clinical and academic partners
- Improved patient and staff engagement with the health service, through an accessible pathway to prototype and test innovative ideas
- Improved resilience for the Health Board



## FUTURE IMPACT

- Clinical and academic case studies
- Future collaborations between industry, academic, and clinical partners
- Adoption of new technology
- Increases in employment
- Sharing of innovative practices with other health boards pan Wales, and beyond

### Exhalation Valves

A shortage of supplies during the current COVID-19 crisis has meant that the Health Board hasn't been able to get hold of certain valves and connectors. An example of this is an exhalation valve (see figure).

The innovation hub worked closely with the Respiratory team to create a 3D design of the valve, and enable the production of in-house printed versions. The Respiratory team has since published this design across their UK national governing body for practice sharing purposes.