

Instant patient isolation

Wherever it's needed



Use of Rediroom during the UK Coronavirus Pandemic

Rediroom is a single patient use, disposable isolation facility that is intended to augment a healthcare provider's existing isolation capacity when demand exceeds supply.

Rediroom can be rapidly deployed in five minutes around a patient and can be removed in a similar timescale, returning the area rapidly to normal functionality.

Originally designed for infections requiring contact and droplet precautions, testing demonstrates a slight negative pressure effect, the air from the room exiting through a fan which draws the air through a disposable HEPA filter.

This has meant that during the pandemic, UK hospitals with overburdened isolation facilities chose to use Rediroom for isolating potential and confirmed COVID cases in order to reduce transmission, improve patient flows and to enhance patient and staff safety.



The need for Rediroom

Globally, with the exception of the USA and private provider facilities, many hospitals do not have a majority of beds as single room accommodation. In the UK, bays of 4, 6 or even 8 patients are not uncommon, yet the demand for single room accommodation for the isolation of patients affected by multi-drug resistant organisms continues to increase.

Some healthcare providers in the UK have as little as 11.5% of bed stock as sole occupancy rooms and 12% of all NHS organisations have single room occupancy capacity of less than 20% of their bed stock.

Conversion of existing hospital spaces into single occupancy is complex, disruptive, and expensive and normally results in a loss of bed capacity, so there is a need for a flexible and portable solution that can be deployed without interfering with other hospital activity.

What is Rediroom?

Rediroom is a highly mobile cart that, when fitted with a disposable canopy, expands to create a single patient use isolation room that can be installed in any suitable space and even around a bed-bound patient in under five minutes.

The canopy features four windows that have privacy blinds, a foot-operated non-touch door mechanism and when erected, the walls are secured the floor with a non-residue adhesive tape.

The rear of the canopy behind the patient has a fan that draws air from within the room out via a single-use disposable HEPA filter.

The area behind the patient is designed to allow services such as oxygen, suction, patient call and electrical supplies to be passed through.

The canopy material is flame-retardant. Once deployed, the cart that supports Rediroom then acts as a storage facility for essential personal protective equipment and hand hygiene supplies, meaning that the deployment of the device contains all of the essential requirements for effective patient isolation.



The science behind Rediroom

Rediroom was originally developed to assist with patient flow through an accident department. The designers then engaged with high-profile researchers to test whether the prototype would: a) be practical and usable in a clinical environment and b) meet existing guidelines for isolation facilities in the UK and

Australia. Independent research studies conducted in Australia and published in peer-reviewed journals demonstrated that Rediroom was indeed functional when used clinically⁽¹⁾ and that it did also meet all of the relevant components of existing guidelines⁽²⁾.

How was Rediroom used during the pandemic?

At the time of the pandemic, spread of the SARS-CoV-2 virus was thought to be predominantly spread by contact with droplets, poor hand hygiene and fomites. Rediroom was designed for droplet and contact precautions and therefore was seen to be an appropriate facility, allowing the rapid deployment of a protective space in which a potential or confirmed COVID-19 case could be placed in order to reduce the risk of transmission of the virus. Rediroom was also used for conducting routine Aerosol Generating Procedures (AGPs). In response to the pandemic, 28 NHS Provider organisations purchased a total of 279 Rediroom carts, meaning an overall 1% increase in the isolation capacity of the entire NHS in England,

an average of 5% in purchasing organisations, and with one organisation increasing by 12%. One hospital (Derby) deployed one device and almost immediately purchased a further 37 as the utility was immediately apparent, with the story even featuring on a BBC news bulletin. Even when the role of aerosols, particularly short-distance, became clearer, hospitals continued to purchase and utilise Rediroom, as risk assessments showed that it was an acceptable solution to the problem of a shortage of isolation facilities. During the second phase of the pandemic in the UK, over 2,500 patients that would not otherwise have been isolated were cared for in Rediroom facilities in acute hospitals across the UK.

How did NHS Organisations use the Rediroom?

Rediroom was used for both suspected and confirmed COVID-19 cases, for infections normally requiring contact and droplet precautions (MRSA, C. difficile, MDR Gram-negative infections, Norovirus etc.), for isolation of renal patients attending for dialysis and for end-of-life patients for privacy and dignity purposes.

Here are a few examples from Hospitals of how Rediroom is used flexibly in the NHS:

Imperial College NHS Trust

Imperial is a huge NHS organisation in London, based on a number of hospital sites, including St Mary's, the Hammersmith Hospital, and Charing Cross Hospital. Rediroom was used to care for patients undergoing non-invasive ventilation, which is classed as an AGP. These procedures were carried out in the Emergency Department, where isolation capacity is limited and the need for the urgent implementation of vital therapy was paramount.

Guy's and St Thomas' NHS Trust

Guy's and St Thomas' NHS Trust is a very large teaching organisation including Guy's Hospital, the Evelina Children's Hospital and St Thomas' Hospital on the banks of the River Thames, opposite the Houses of Parliament. It is where the Prime Minister Boris Johnson was cared for when he was seriously ill with COVID. Although 19 Rediroom devices were originally

purchased for the more traditional pathogens that would require contact and droplet precautions (MRSA, C. difficile, Carbapenem-resistant gram-negatives, Pertussis, Meningitis etc), Rediroom was also used to house COVID patients in the paediatric ICU, enabling visibility of vulnerable patients and also to perform AGPs and non-invasive ventilation. This meant that, during the pandemic, permanent isolation rooms could be emptied of patients with the patients under contact and droplet precautions, enabling the most flexible use of the existing isolation capacity through the use of Rediroom.

University Hospitals of Derby and Burton NHS Foundation Trust

This is a large organisation serving an area of the north midlands. Rediroom was implemented in the admission areas for screening and segregation of patients with suspected infection with respiratory viruses. These areas were called the High Risk Assessment Unit. Following screening, patients were then either admitted to confirmed COVID cohort or non-COVID areas. Even in this large healthcare provider organisation, overall isolation capacity was increased by 9% by the purchase of 38 Redirooms. This organisation's use of the Rediroom was featured in a BBC News Bulletin along with supporting interviews with staff.

The Shrewsbury and Telford Hospital NHS Trust

In this organisation serving part of the West Midlands in the UK, Rediroom was used for clinically suspected and confirmed patients with respiratory viruses (including Influenza A, B and SARS-CoV-2) as well as other infections (other current infection eg. MRSA, CPE, C.diff, VRE, ESBL). As regards clinical procedures, performance of AGPs was permitted within Rediroom.

Southport and Ormskirk Hospital NHS Trust

This provider was the first in the UK to purchase 11 Redirooms at an early stage of the COVID pandemic in 2020. This increased the isolation capacity of the Trust by just under 10%. The devices were used for potential and confirmed COVID patients and AGPs were performed within them.

Other Healthcare Providers

A number of large healthcare providers throughout the UK purchased significant numbers of Rediroom devices, including United Lincolnshire (38), Kettering (10), Manchester University Hospitals Foundation Trust (21) and Liverpool University Hospitals Foundation NHS Trust (21). NHS Nightingale Hospitals, which were temporary hospitals set up within exhibition centres throughout the UK were also purchasers. Rediroom was also implemented in a number of NHS organisations as part of a regional initiative across the North-West of England as part of an initiative led by NHS England and NHS Improvement.

Conclusion

During the ongoing SARS-CoV-2 pandemic, Rediroom has proved to be an invaluable resource in the NHS across the UK. It has increased isolation capacity, assisted with patient flows in areas traditionally short of isolation capacity and allowed flexible placement of infected and potentially infected patients, many of whom would otherwise been cared for in open areas, increasing risks to both staff and other patients.

References

1. G., A. Williams, and Z. Wong, Assessing the functionality of temporary isolation rooms. *Am J Infect Control*, 2017. 45(11): p. 1231-1237.
2. Mitchell, B.G., et al., Assessing a temporary isolation room from an infection control perspective: A discussion paper. *Infect Dis Health*, 2017. 22(3): p. 129-135.