CASE STUDIES

Maintaining patient flow

How Rediroom, a temporary patient isolation unit, has been used to increase isolation capacity and prevent bed closures.

Case study 1: North Lincolnshire & Goole NHS Foundation Trust

At a glance

Hospital-onset COVID-19 cases plummeted by 75% in North Lincolnshire & Goole NHS Foundation Trust after they introduced 30 Redirooms to their admissions and short-stay wards.

- **30 Redirooms deployed across two hospitals**
- **850 bed organisation**
- **Primary use: admissions units and short stay wards**

75% reduction
in hospital-onset COVID-19 cases

Nominated for the HSJ's Patient Safety Award
in the Infection Prevention & Control category

Findings presented at ECCMID
(European Congress of Clinical Microbiology & Infectious Diseases) conference in 2022

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Case study 1: North Lincolnshire & Goole NHS Foundation Trust continued

Challenge

Before the intervention, the organisation's community was seeing new COVID infections much higher than the national average. This placed strain on the existing infrastructure.

When isolation capacity can't meet demand, it creates a vicious cycle: on the open ward, a single positive case could spread to other patients within the bay. This, in turn, creates greater demand for isolation – with positive patients and confirmed contacts adding to the list of those awaiting an isolation bed.

- **Not enough isolation spaces.** Less than 15% of beds are in single-patient side rooms.
- **Increased demand on isolation.** High local incidence of infections meant existing isolation spaces were limited.
- **Bed closures and cohorting.** Without available side rooms, infectious patients must be cared for together on an open ward. This leads to bed closures as uninfected patients are unable to be safely cared for on that ward.

Intervention

30 Redirooms were introduced in October 2020. To begin with, the primary use is on admissions units and short stay wards.

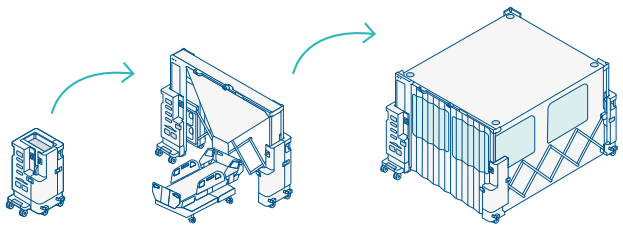
- **Patient screening.** Newly admitted patients are placed in a Redirooom whilst they await the results of their screening tests. If negative, they can be moved to a bed on the open ward. If positive, Redirooom prevents the other patients on the ward from being exposed.
- **Flexible isolation.** When side rooms on any wards are at capacity, the hospital 'Redirooom Champions' erect a Redirooom to isolate the patient safely on their home ward.
- **Supplement existing isolation rooms.** Redirooom frees up traditional isolation rooms, creating increased capacity for high-risk patients to be cared for in existing side rooms.

Outcome

- **75% reduction in hospital-onset COVID.** Patients were safely isolated whilst awaiting screening results.
- **Reduced bed closures**. By increasing isolation capacity, the team reduced the need for cohorting and bed closures. The team were able to demonstrate cost-effectiveness due to reduced bed closures.
- **Made patients feel safe.** 84% of patents surveyed said the Redirooom made them feel safe.

"Unless you have a hospital of all private rooms, you never have enough isolation spaces."

Linda Barker
Infection Control Team Leader
North Lincolnshire & Goole NHS Foundation Trust.



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Increase patient isolation capacity

Before Rediroom

Healthcare professionals often are faced with the hard decision to close whole bays in response to unmanageable infections. As a result, up to 5 beds additional beds can be closed in order to isolate one infectious patient in a ward.

There is an associated cost with bed closures, as well as challenges which can prevent new patients finding a bed. Unable to access necessary care, patients are at higher risk.

Unless rapid action is taken to find a new way to isolate infectious patients, susceptible patients and staff in the local area are also at risk of developing an infection in the healthcare environment.

The additional burden of preventable infections adds to patients' length of stay and puts their wellbeing at risk. Healthcare-associated infections are also responsible for staff absences, patient deaths, and financial costs[1].

After Rediroom

Used to isolate patients under droplet and contact precautions, Rediroom helps prevent closure of beds and bays caused by limited isolation space.

Placing infectious patients within a Rediroom creates a physical separation to disrupt direct contact. Simultaneously, a H14 HEPA filter removes respiratory droplets and pathogens from filtered air.

Rediroom stores as a PPE station promotes best practice, putting protective equipment, hand hygiene and surface disinfectants all at the point of use.

When additional isolation capacity is needed, Rediroom can be manoeuvred and deployed into a ready-to-use single isolation space – in as little as 5 minutes.

Using Rediroom, patients can be cared for within their original ward.

Allowing the surrounding beds to be used for other patients, and keeping single isolation rooms available for others.

Rediroom is suitable for:

- **Influenza**
- **Diphtheria**
- **Mumps**
- **Pertussis**
- **Meningococcus**
- **Norovirus**
- **Aspergillus**
- **Adenovirus**
- **Rotavirus**
- **Group A streptococcus**
- **MRSA**
- ***C. difficile***
- **Gastroenteritis of unknown aetiology**
- **CPE**
- **Multi-drug resistant organisms (MDROs)** including Gram-negatives
- **Other infections requiring droplet or contact precautions**

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Cost-effective solution for patient flow

Permanent solutions reduce overall capacity

Historically, nearly 1 in 4 times that a patient should be cared for in isolation, they have to be cared for on an open ward[2].

With the rise of antibiotic resistance, healthcare providers often look to convert existing multibed wards into multiple single side rooms. Permanent construction is expensive, difficult to organise within a working hospital and results in a reduction in overall bed capacity. Typically, a 6 bed open ward could only be converted to 3 single side rooms.

Rediroom can fit into a standard bed space, allowing healthcare providers to increase their isolation capacity without reducing their overall number of beds.

NHS Trusts that have introduced Rediroom have increased their isolation capacity by up to 12%.

Because Rediroom provides effective isolation without requiring construction work, it offers healthcare providers a cost-effective solution to increase their isolation capacity.

The cost-effectiveness of temporary single-patient rooms to reduce risks of healthcare-associated infection[3]. Graves et al. *J Hosp Infect.* 2021.

Examining the suitability of Rediroom as a solution to isolation demands, authors constructed a financial model that evaluated the impact of temporary isolation units within the NHS.

Healthcare-associated infections cost the NHS £2.7 billion per year[1], effective interventions to reduce the spread of HCAIs have significant financial impact on Trusts.

The authors found that Rediroom was likely to be cost-effective in the NHS.

Healthcare-associated infections cost the NHS

£2.7 billion
per year[1]

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Raiseable window blinds
Lower for patient visibility or raise for privacy

Integrated PPE station
Everything you need, always at the point of use

HEPA & carbon air filtration
Filters 99.995% of particles from infectious air

Easy decontamination
Collapsible canopies and easy-to-clean frame combine to allow effective terminal clean

Hands-free entry and exit
Reduce the risk of contact-spread infection

Room to manoeuvre
Rediroom packs into a cart that can be easily wheeled to a patient's bedside[4]

Wall-to-floor seal
Isolate patients under contact and droplet precautions

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Rediroom in the NHS

Overcoming single isolation limitations

In the UK, bays of 4, 6, or 8 patients are common, while single isolation spaces are not – with single rooms making up less than 20% of bedstock for 12% of all NHS Trusts. With the ever-increasing threat of antimicrobial resistance and resulting MDROs, there is additional pressure of already-limited single isolation spaces.

In response to the pandemic, 28 NHS Trusts purchased a total of 279 Rediroom units, meaning an overall 1% increase in the isolation capacity of the entire NHS in England.

Across the Trusts using Rediroom, patient isolation increased by an average of 5%, and with one organisation increasing by 12%.

During the second wave 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.

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.

As little as **11.5%**
of beds are in single occupancy rooms.

In one NHS Trust, Rediroom
increased isolation capacity by up to 12%.

Over 2,500
patients isolated with Rediroom
during the second wave of the pandemic.

Case study 2: Imperial College NHS Trust

Imperial is based across a number of hospital sites, including St Mary's, Hammersmith Hospital, and Charing Cross Hospital. Rediroom was used to care for patients undergoing non-invasive ventilation, which is classed as an aerosol generating procedure (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.

Case study 3: Guy's and St Thomas' NHS Trust

Guy's and St Thomas' NHS Trust is a teaching organisation including Guy's Hospital, Evelina London Children's Hospital and St Thomas' Hospital. 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.

Placing patients in Rediroom gave healthcare professionals better visibility of their patients, as well as better access for performing AGPs and non-invasive ventilation. Using Rediroom for patients with contact and droplet precautions, permanent isolation rooms were kept free for patients with other infections - this was crucial for managing isolation space during the pandemic.

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Case study 4: 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 caused by respiratory viruses. These areas were called the High Risk Assessment Unit. Following screening, patients were then admitted to either a confirmed COVID cohort or non-COVID area. 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 from staff.

Case study 5: 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 (eg. MRSA, CPE, *C.diff*, VRE, ESBL). As regards clinical procedures, performance of AGPs was permitted within Rediroom.

Case study 6: 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.

Case study 7: 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.

References

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