NHS
Coventry and Warwickshire Partnership
NHS Trust

Report

Reducing assaults and self-harm in acute mental health hospitals

Coventry and Warwickshire Partnership NHS Trust
in partnership with Oxehealth

oxehealth

Executive Summary

Acute mental health inpatient hospitals face a challenge: how to provide high-quality care and prevent safety incidents whilst giving patients a sense of privacy and agency.

Staff are stretched. Despite established protocols, safety incidents such as self-harm, violence and aggression, contraband-use, physical health deterioration and more, still occur.

Coventry and Warwickshire Partnership NHS Trust (CWPT) has an acute inpatient mental health facility in Caludon Centre. Caludon Centre embarked on a world-first project to help improve the safety and quality of care delivered on their inpatient wards. In 2018, the clinical team started a research study to assess the impact of a technology (Oxevision) on patient safety, quality of care, and patient experience.

The technology is a vision-based patient monitoring and management platform that gives clinical teams additional insights to help them plan patient care and intervene proactively. See how it works in the Appendix.

The technology was installed on three wards: a 22-bed female acute ward, a 20-bed male acute ward and an 11-bed psychiatric intensive care unit (PICU) with a seclusion room.

The research study was a 'before and after' and partial cohort study, with a 12-month baseline and a 12-month intervention period. Potential operational confounders were identified and assessed, with none identified to have impacted the results. See the study methodology in the Appendix.

Study Findings

When staff used Oxevision to augment their existing clinical practice, the following was observed:

Self-Harm

22%

Reduction in self-harm in acute bedrooms

Assaults

26%

Reduction in assaults in PICU bedrooms

Rapid Tranquillisation

40%

Reduction in rapid tranquillisation related to assaults in PICU

Ligatures

66%

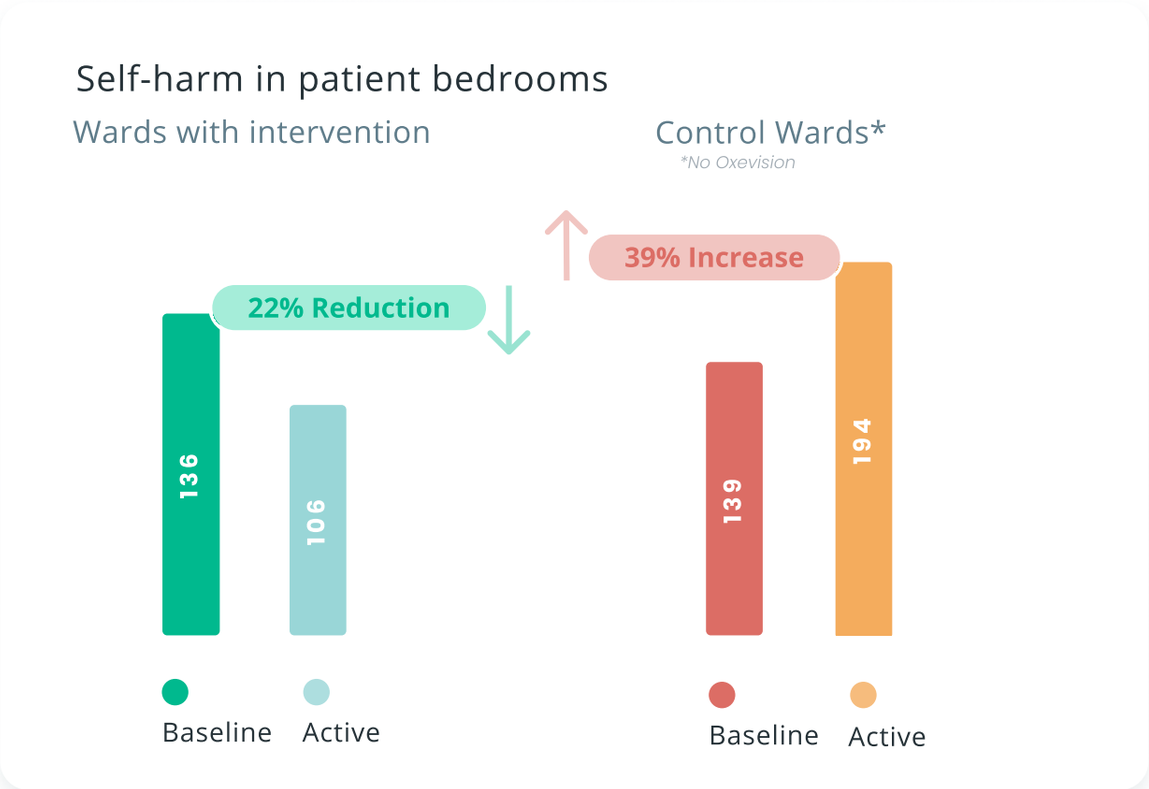
Reduction in en-suite bathroom ligatures in acute bedrooms

Self-harm has reduced in acute bedrooms

22% Reduction in self-harm in bedrooms

Self-harm in patient bedrooms reduced by 22% on acute wards equipped with the technology during the intervention period, compared to the baseline period. [1]

On the control wards (those not equipped with the technology) during the same period, self-harm increased by 39%. The relative reduction in self-harm on wards equipped with the technology versus the control wards was 44%. [2]



Aleah Cox, Nurse, Acute Ward

We were concerned about a patient that was known to be at high risk of ligating. We had just done their observations, but we felt uneasy about her safety.

In the past, when we have concerns and go to their room, patients hear our footsteps and hide what they're doing, so we must catch this behaviour early.

In this case, we used the system to take a spot check vital sign measurement and ensure she was ok in her bedroom. When doing so, we could see that she was trying to tie something.

We went to her room and removed the item before she could come to any harm. We've caught a few potential ligatures early in this way.

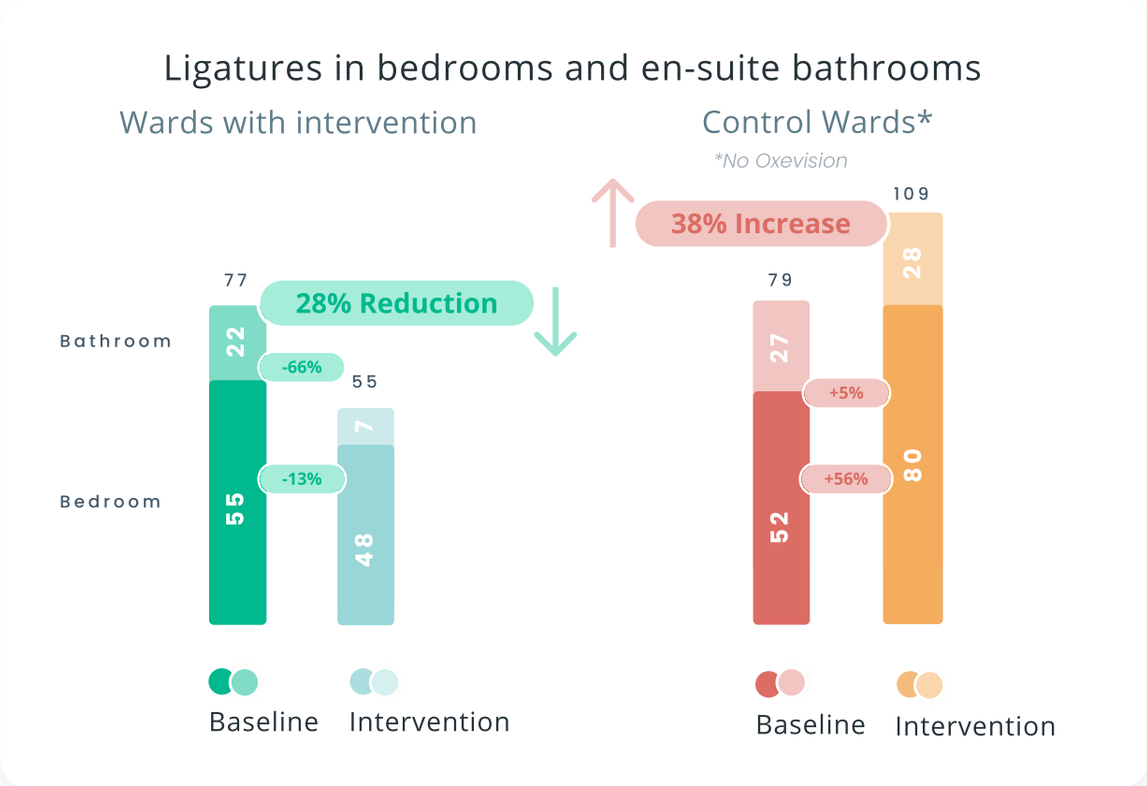
Ligatures have reduced, especially in en-suite bathrooms

28% reduction in ligatures in bedrooms

Self-harm via ligature represented 56% of all self-harm incidents in acute patient bedrooms during the baseline period.

Ligatures in patient bedrooms reduced by 28% on the acute wards equipped with the technology during the intervention period. Specifically, ligatures in en-suite bathrooms reduced by 66%.

On the control wards during the same period, ligatures increased by 38%.[3] This represents a relative reduction in ligatures of 52% on wards equipped with the technology versus the control wards.[4]



Elly Davies, Healthcare Assistant, Acute Ward

There was an incident where a patient ligated. It alerted us [when she had spent 5 minutes in the en-suite bathroom]. This patient was quite a high risk, so we knew it would be important to know when she had gone into her bathroom for a long period.

Assaults have reduced in PICU

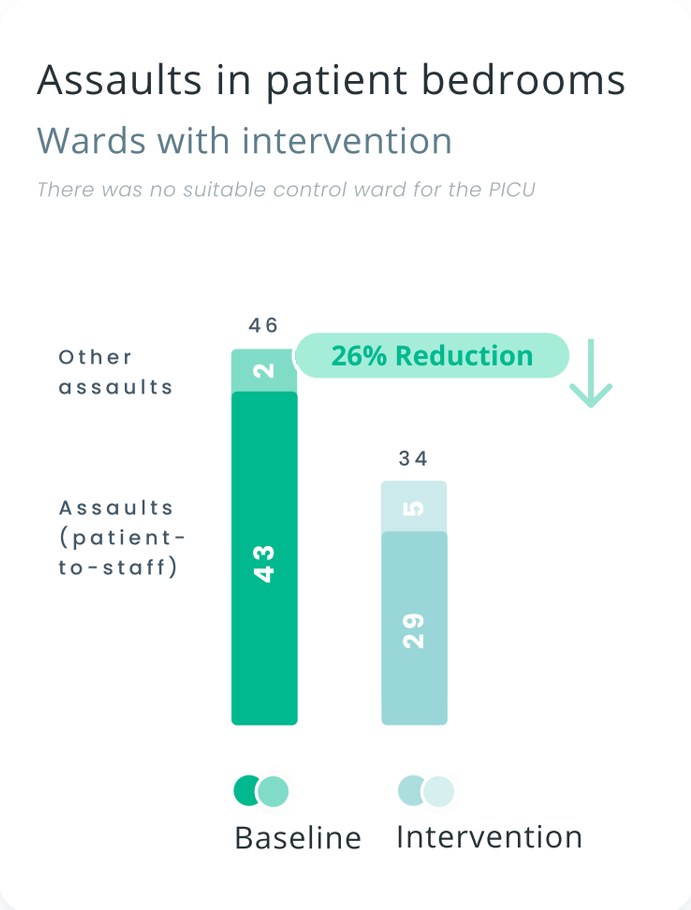
26% reduction in assaults in bedrooms

Assaults in bedrooms reduced by 26% in PICU during the intervention period, compared to the baseline period. [5]

Staff reported that they are now able to monitor the physical health and behaviour of patients in their bedrooms, in a less intrusive way. This enables staff to de-escalate patient behaviour in patient bedrooms and to ensure patient safety whilst minimising the risk of non-therapeutic intrusion and re-escalation.

The severity of injuries associated with assaults remained low. 90% of assaults were classed as "low harm". [6] Critically, there were no bedroom assault incidents associated with A&E visits since the implementation of technology, compared with two A&E visits in the baseline period.

Oxevision provides staff with insights which can support them to plan patient care and prepare for intervention. Through providing location and activity based alerts, the technology can can also notify staff of potential high-risk activity — for example, when activity indicates that a patient may have left there room or there are multiple people in a patient's room. Using this information in combination with known clinical data, staff can be more prepared when attending to high-risk patients which may prevent potential incidents and injuries from occurring.



Matthew Dryclan, Healthcare Assistant, PICU

There have been a couple of times where patients are quite agitated, and if the system is on, you can have a look to see what they're doing to assess — is it worth sending someone in to talk to them, or is anyone going to be at risk of getting hurt? Are they going to hurt themselves?

Case Examples

Using the least restrictive option to de-escalate behaviour

Rachel Webb, Ward Manager, Acute Ward

Sometimes we get patients that are far more unpredictable or are known to be aggressive. When we interrupt patients in their rooms, the patient can take offence, and the situation escalates very quickly. They can become aggressive, and they might not be able to bring themselves back down.

At that point, we may need to use a physical intervention, potentially restrain that patient and it can escalate further. It may end up needing Rapid Tranquillisation because we have entered the room.

Having the option to monitor patients closely [by taking remote spot-check measurements of vital signs] allows us to make the right judgment call and avoid escalation. It means we can use the least restrictive option, and the patients get a better standard of care.

Maintaining patient and staff safety in seclusion

Sophie Jones, Nurse, PICU

We had a patient in seclusion that was violent and aggressive. We didn't want to enter the room, which would put us at risk and further agitate the patient.

He pushed the mattress up against the door, blocking our view into the room. We couldn't assess him visually, but we knew he was a danger to himself and the staff.

Using the Oxehealth system, we could monitor his physical health and make better informed clinical decisions without putting the patient or ourselves at risk.

Without the system, we would have had to call the police and wait for them to arrive for support.

Rapid tranquillisation reduced in PICU

40% reduction of rapid tranquilisation events related to assaults

Patients may require rapid tranquillisation when exhibiting acutely disturbed or violent behaviour and are at risk of harming themselves or others.

Administration of rapid tranquillisation related to all assaults (not specifically assaults in bedrooms) has reduced by 40% on the PICU. [7]

Staff often guide an agitated or aggressive patient to their bedroom, where they can now use the technology to monitor the patient's safety and well-being in a non-intrusive, remote manner whilst remaining nearby to intervene therapeutically when support is needed.

Alongside reducing assaults, the staff report this as a key mechanism for reducing administration of rapid tranquillisation.

Matthew Dryclan, Healthcare Assistant, PICU

We had a patient that was agitated, and we were able to keep monitoring him in his bedroom using the system. We could make sure the situation had come to an end or whether we needed to look into different forms of observations, maybe support the patient to remain in their room for a little while, maybe bring the patient out for a while. The system allows for a myriad of opportunities that we might not have possibly known about beforehand without "barging in" and escalating the situation further.

Physical health monitoring of patients has improved

Clinicians can now use the technology to take contact-free spot-check breathing rate and pulse rate observations of patients in bedrooms remotely, without disturbance.

Staff have given case examples of improved physical health monitoring when traditional methods are not an available option or may be detrimental to the patient's care.

These case examples include monitoring at night to aid better sleep, following medication, and monitoring when physical health is at risk and needs to be checked frequently (i.e. patients with comorbidities).

Case Examples

Monitoring physical health following rapid tranquilisation on an acute ward

Rachel Iype, Deputy Ward Manager, Acute Ward

We had a patient that was violent and aggressive. He was a danger to himself and others, and we couldn't calm him down after initial intervention. We had to administer rapid tranquillisation.

We follow strict procedures of taking physical observations of a patient multiple times for the first hour to ensure they are safe. However, he refused to have his physical observations taken and continued to be aggressive.

We used the system to measure his breathing rate and pulse rate remotely and ensure he wasn't a threat to himself while avoiding further agitation. Having the system has been fantastic for this purpose because we can make sure we are caring for the patient's physical health and keeping the risk of harm low.

Monitoring physical health following medication

Rachel Webb, Ward Manager, Acute Ward

Some medication we administer carries a risk of raising the patient's pulse rate, especially if their pulse rate was high before the medication was taken. In these situations, we regularly monitor the patient's pulse rate using the system before administering the medication.

We can then closely monitor their pulse rate using the system to keep a close eye on them after taking the medication.

We would normally attempt to measure a patient's vital signs in person before administering their medication, but if they refuse to have it checked, we might not be able to check again until the next day. Having the system to do physical health checks is really useful.

Research scope and methodology

A before and after and partial cohort study (acute wards only) was conducted from January 2018 to December 2019 on an 11-bed male psychiatric intensive care unit (PICU) with one seclusion room, a 22-bed female acute ward, and a 20-bed male acute ward.

Incident and survey data were collected:

Surveys and interviews were conducted three months into the technology implementation in April 2019 to determine the early insights from patients (surveys n = 11; interviews n = 2) and staff (surveys n = 23; interviews n = 6). A report, Improving safety in acute Mental Health hospitals, has been published detailing additional insights from staff and patients from the surveys and interviews.

It was approved by Wales Research Ethics Committee 5. The Chief Investigator was Dr Kay Wright, Head of R&I; the Principal Investigator was Dr Faith Ndebele, Consultant Psychiatrist.

Control wards were established for the acute wards, namely a 20-bed male acute ward and a 20-bed female acute ward to compare incident data. There was not a suitable control ward for the PICU.

Oxevision was installed in 100% of bedrooms. Patient consent was obtained from patients or, where appropriate, by the Consultant in their best interest to switch Oxevision on in their bedroom. To date, patient consent rate is 72% across the acute wards (144 out of 201 approached; age range: 18-82) and 68% in the PICU ward (21 out of 31 approached; age range: 18-87).

The clinical study was sponsored at Executive level by Mel Coombes, Chief Executive Officer.

Operational confounders were considered over the period of study across: staffing and management, patient cohort, governance, policies and protocols and technology. No operational confounders were identified as accountable for the results in the study analysis.

Appendix: Technology

Oxevision is a contact-free vision-based patient and management platform. It uses an optical sensor (camera and infrared illumination in a secure housing unit on the wall). Staff can use it to confirm a patient is safe through a short, 15 second, visual check where they can also take remote spot-check measurements of a patient's vital signs. Oxevision's location and activity based alerts and warnings can also notify staff of activity that may indicate a patient needs help or assistance.

Staff interact with the technology via a screen in the nurses' station and portable tablet devices. It enables clinicians to:

01 Take medical grade cardio-respiratory spot-check measurements remotely (i.e. no need to enter the patient's room to get pulse rate & breathing rate of a resting patient)

02 Access cardio-respiratory trends from the previous 24 hours with Oxevision's Vital Signs Trends. This can provide staff with additional insight into the patient's recent state and surface any underlying trends which they may want to further investigate.

03 Receive location and activity based alerts and warnings which may indicate high-risk activity, prompting an additional safety check (i.e. be notified of activity indicating a person has spent a prolonged time in the bathroom, leaves their room, gets out of bed)

04 View objective patient activity reports (daily, weekly) to support individual patient care planning

About

Coventry and Warwickshire Partnership NHS Trust

Coventry and Warwickshire Partnership NHS Trust provides a wide range of mental health, learning disability and community health services for people of all ages through in-patient, community and day clinics.

Coventry & Warwickshire Partnership NHS Trust (CWPT) have been working in partnership with Oxehealth since 2017, initially trialling Oxevision in their Older Adult services (a dementia inpatient facility), and in 2018, extending its use into their acute & PICU inpatient facility.

Oxehealth

Oxehealth is a global leader in vision-based patient monitoring and management. We help clinicians to deliver safer, higher quality, and more efficient care.

Our Oxevision platform includes Vital Signs; a medical device cleared for use in the UK, Europe and the USA. Unlike conventional remote patient monitoring companies, Vital Signs enables clinicians to measure pulse and breathing rate without a device being attached to the patient, helping to preserve patient independence, privacy, and dignity. Through also providing location and activity based alerts and warnings, Oxevision can notify staff of potential high-risk activity which can support them to plan patient care and intervene proactively to help patients.

Footnotes

1 Caludon Centre incident analysis, January 2018 to December 2019.

2 Statistically significant results ($p<0.002$). Statistical significance was evaluated using the Basic Bootstrap method (Davison and Hinkley 1997, equ. 5.6 p. 194) with resampling applied over subjects, rather than over incidents. Relative reduction calculated as the ratio between the ratio of incidents in the intervention period versus baseline period for the ward equipped with the technology, and the ratio of incidents in the intervention period versus baseline period for the control ward.

3 Caludon Centre incident analysis, January 2018 to December 2019.

4 Statistically significant results ($p=0.05$). Statistical significance was evaluated using the Basic Bootstrap (Davison and Hinkley 1997, equ. 5.6 p. 194) with resampling applied over subjects, rather than over incidents.

5 Caludon Centre incident analysis, January 2018 to December 2019.

6 Low harm incidents are defined as incidents that resulted in minor harm to a patient or staff member that did not require treatment at A&E or a minor injuries unit. Caludon Centre incident analysis, January 2018 to December 2019.

7 Caludon Centre incident analysis, January 2018 to December 2019. Statistically significant results ($p=0.001$) when compared to control wards. Statistical significance was evaluated using the Basic Bootstrap (Davison and Hinkley 1997, equ. 5.6 p. 194) with resampling applied over subjects, rather than over incidents.