

Human factors review of the use of mechanical restraint in high secure hospital settings

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Foreword from commissioners

Mechanical restraint is a restrictive intervention in mental health care. In context it usually refers to the use of intervention techniques and equipment to support patient care in complex environment, however, it has been an area of focus in terms of practice, risk around management and oversight. A programme was commissioned to consider use of restraint techniques in secure environments within the NHS.

This briefing paper has been developed to support a shared understanding of current practice, highlight key risks, and inform improvement across High Secure Mental Health Services.

The aim was to consider when and how mechanical restraint is applied, ensuring that decisions are grounded in patient care, safety, and evidence-based practice. This work aligns with NHS England's commitment to reducing restrictive interventions and promoting compassionate, person-centred care. It also reflects the principles of human factors science, recognising the complex environments in which staff operate. This report can influence how working practice and care environments develop in support of patients and staff.

We wish to acknowledge the collaborative effort behind this paper, including contributions from clinical teams, and commissioners. In particular, we extend our thanks to Health Innovation East Midlands for their leadership in driving this work forward.

We encourage all readers to use this briefing as a foundation for dialogue, reflection, and action.

Introduction

There are four high secure hospitals in the United Kingdom (The State, Rampton, Broadmoor, and Ashworth). All four hospitals provide care for males with a diagnosed mental health condition. One of the hospitals also provides the national services for female patients, deaf patients, and those with learning disabilities. At the time of review one of the hospitals did not support the use of mechanical restraint (MR) within the organisation. However, this hospital has been included in all possible elements of this review to allow comparison and to support shared learning.

MR is a form of restrictive intervention that refers to 'the use of a device to prevent, restrict or subdue movement of a person's body, or part of the body, for the primary purpose of behavioural control' and needs to be used in line with a legal framework. (Department of Health, 1983)

Following a review of data for MR use, Health Innovation East Midlands (HIEM) were commissioned by the East Midlands Mental Health Alliance for Mental Health Learning Disabilities and Autism and NHSE (Midlands) Specialised Commissioning team for Mental Health to use a human factors approach to better understand when and how mechanical restraint is currently used across the high secure hospitals in the UK, including identifying barriers and facilitators for appropriate use.

Objective

The aim of this report is to provide understanding, guidance on possible improvement areas, and to be a resource of information to support the creation of inaugural best practice guidance for MR use in the United Kingdom.

Methodology

Taking a human factors approach has allowed this review to look across the system, to study the interactions between the people and the elements of the work system, and identify factors that affect the use of MR that may not have been easily identified by other methodologies. A definition of human factors is 'the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance.' (International Ergonomics Association, 2020)

This review has collected data to support the understanding of how and when mechanical restraint is used (considering aspects such as policies, data, environmental, cultural and patient factors), variation in use and the possible reasons for this, staff and patient experience, and what good practice could look like. This has been done through:

- Literature review
- Reviewing incident data
- Site visits that included:
 - ward visits
 - focus groups with staff
 - interviews with ward managers
- Clinical notes review
- Patient survey.

Hierarchical task analysis was used to map MR processes and legislation (to understand work-as-imagined) then the process was reviewed through site visits and discussions with the healthcare teams (to understand work- as-done) and appreciate the variation and adaptations in the system (Shorrock, 2016). Data was also analysed using a human factors framework called Systems Engineering Initiative for Patient Safety (SEIPS) version 2. (Holden et al., 2013) which supports the analysis of complex systems.

Key findings

The literature review identified 83 articles and highlights that as there are few published articles that focus on mechanical restraint and very little from the UK, there is a research gap in this area. The literature review has been published in the academic literature.

What is clear from this review is that solely looking at quantitative data does not give a clear picture so caution should be used when comparing numerical data between hospitals. There was curiosity and to some extent assumptions made about the way mechanical restraint is used by other hospitals. The use of MR is highly nuanced and multi-faceted.



Combined MR incident data shows that 98% of MR applications were for planned events, and this rate is consistent across the hospitals. In 89% of cases this was due to threats to self or others. Less than half of patients received a documented patient debrief after MR was used, and patient debriefs may not be routinely offered. Patients could articulate the reason MR was used and most felt the use of MR was helpful or needed.

Qualitative data adds context to the numerical data and identifies some key aspects to MR use:

1. **Patient population affects the use of MR.** MR use is higher in the women's and learning disability services. It is lower in specific hospital(s) possibly because of the legal framework that changes the prevalence of certain clinical conditions in the hospitals such as personality disorder.
2. **Organisational preferences for restrictive practice vary.** This may warrant further exploration to understand the benefits and harms but was outside the scope of this review. There was variation noted in the use of seclusion and long-term segregation between hospitals.
3. **There are seven key influencing factors in the work system.** The SEIPS framework defines a work system model with six components (person, tools and technology, tasks, internal organisation, environment, and external Organisation). In our analysis, seven key influencing factors were identified as having the highest number of interactions between these components. These factors were concentrated within the first four components: person, tools and technology, tasks, and internal organisation. Ensuring these factors are highly effective is recommended to optimise the safe and appropriate use of MR. The factors are:
 - When considering the **person component**, staff should feel empowered and informed to make decisions about the application and removal of MR for planned use in line with an agreed plan, and this is supported by ensuring MR training is mandatory for all staff involved.
 - In the **tools and technology component**, ensuring a MR work procedure that is robust, fit for purpose, and in an easily accessible format is essential. Also, ensuring the MR care plan that has been co-produced with staff and patients (or their representatives) is available to all staff and includes guidance on when MR removal should be considered.
 - In the **task component**, having a supportive and responsive oversight group for MR is essential, to agree MR care plans, ensure sufficient organisational support to the ward, and provide effective check and challenge to MR use. But this is balanced by the need to ensure that senior MR trained ward staff can make decisions on application and removal of MR when indicated in a timely manner, in line with an agreed care plan and with the required staffing levels outlined in the work procedure.
 - In the **organisation component** having effective organisational oversight of all MR use is mentioned again but in relation to ensuring appropriate MR staff are available to meet the patient needs, and that data is used to drive improvement across the organisation.
4. **MR equipment used varies but supports the population being served.** Hospitals have chosen their MR equipment carefully to meet the specific needs of their population. The level of restraint varies both between equipment and in the level of restraint possible by a single piece of equipment. Whilst there is currently no desire or

reason to align MR equipment across the hospitals, there is a place for coming together to share learning and review new equipment or practices. We would recommend that the group review the use cases for safety pods and beanbags to decide whether they align with the definition of MR.

5. **There is system variation that is justified but also possible alignment.** There is variation between the hospitals in their MR process, organisational culture, and approach. Whilst some of the variation is justified there are areas where alignment is possible and would be valued by the hospitals. The hospitals have all shown a willingness to be transparent and share learning and have an aspiration to improve patient care.

Areas for improvement and shared learning

Areas where there was agreement across the hospitals for improvement:

- Creation of a set of principles for the use of mechanical restraint that balances the current approach to personalised care and the need to use MR within legal frameworks and national guidance.
- Support staff resilience by reviewing the debrief support provided.
- Optimise the inclusion of the patient voice throughout the MR process.

Areas where variation was identified, learning could be shared, and alignment considered include:

- The relationship between organisational culture, staff feeling empowered and supported to make decisions, and the hierarchy of decision making may warrant further exploration to maximise the effect on reducing MR use.
- Oversight that focusses on improvement and learning.
- Maximising the functionality of the clinical system.
- The staffing requirements and observations requirements across the MR process.

Recommendations

Taking a human factors approach to understanding the use of mechanical restraint has been successful in creating better understanding of all the factors that affect the use of mechanical restraint across the different sites.

The intention is that the findings of this review will be used to drive improvement at both an individual hospital level and across the high-secure service, and to support the production of best practice guidance for mechanical restraint in the United Kingdom.

We have suggested several possible areas that could be prioritised for improvement. Improvement should aim to design a better work system or process that will then deliver improved outcomes. Teams should be mindful that during improvement, adaptations may occur that are supportive and should be captured and embedded, but they may also be unsupportive and need to be designed out.



References

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