

Causal pathways and proportionality in minimising restrictive practices

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Introduction

Reducing restrictive practices in secure forensic hospitals is a key priority for contemporary forensic mental health services. Patients admitted to high security forensic settings typically present with significant unmet treatment needs related to violence risk and severe mental disorder, necessitating structured and proportionate staff responses to incidents.

Ensuring that restrictive practices such as seclusion are applied proportionately, transparently, and in response to clearly identifiable clinical and behavioural factors is essential for ethical practice, patient safety, and service accountability. Evidence-basing staff responses to incidents is therefore of critical importance in forensic settings.

Understanding the causal pathways and dynamic factors associated with the use of seclusion represents a crucial first step in identifying opportunities for earlier intervention and in developing strategies to minimise restrictive practices within high security forensic hospitals.

Aim

The aim of this study was to examine causal pathways associated with the use of seclusion through analysis of incident severity and dynamic risk factors in a high security male forensic inpatient population.

Methods

This prospective cohort study was conducted as part of the DUNDRUM Forensic Redevelopment Evaluation Study (D-FOREST). All incidents occurring on the male high security wards at the Central Mental Hospital (CMH), Dublin, between August 2024 and November 2025 were included.

Incidents were rated for severity of behaviour and proportionality of staff response using the DUNDRUM Restriction, Intrusion and Liberty Ladders (DRILL). Daily Dynamic Assessment of Situational Aggression (DASA) scores were recorded for all inpatients and collated in relation to subsequent incidents.

Associations between incident characteristics, dynamic risk factors, and the use of seclusion were examined using receiver operating characteristic (ROC) analysis. Area under the curve (AUC) values were calculated to assess predictive validity at both scale and item levels.

Results

A total of 841 incidents ($DASA \geq 1$) were included. Higher mean scores on the DUNDRUM DRILL Behaviour scale were significantly associated with the use of seclusion, demonstrating good predictive validity (ROC AUC = 0.782, $p < 0.001$).

Dynamic risk was strongly associated with subsequent use of seclusion. DASA scores recorded on the day prior to an incident were highly predictive of the need for seclusion the following day (ROC AUC = 0.816, $p < 0.001$).

Item-to-outcome analysis identified non-compliance with medication as the DRILL Behaviour item most strongly associated with incidents requiring seclusion (ROC AUC = 0.819, $p < 0.001$). Violence towards others (ROC AUC = 0.585, $p < 0.001$) and escalating risk to others (ROC AUC = 0.593, $p < 0.001$) were also significantly associated.

Incidents involving self-harm ($p = 0.794$) and absconding behaviour ($p = 0.745$) were not associated with the use of seclusion in this sample.

DRILL Behaviour Scale Predicting Use of Seclusion

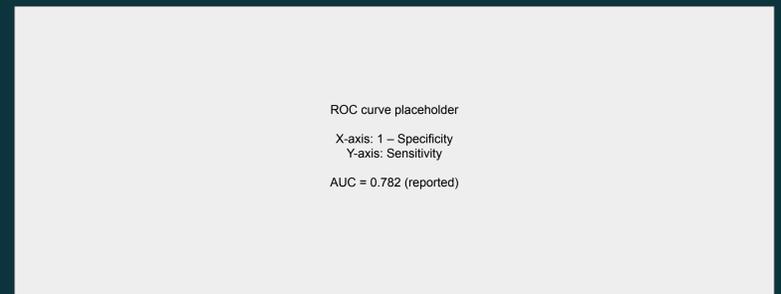


Figure 1. Receiver operating characteristic (ROC) curve demonstrating the predictive validity of mean DUNDRUM DRILL Behaviour scale scores for the use of seclusion.

DASA (Day Prior) Predicting Use of Seclusion

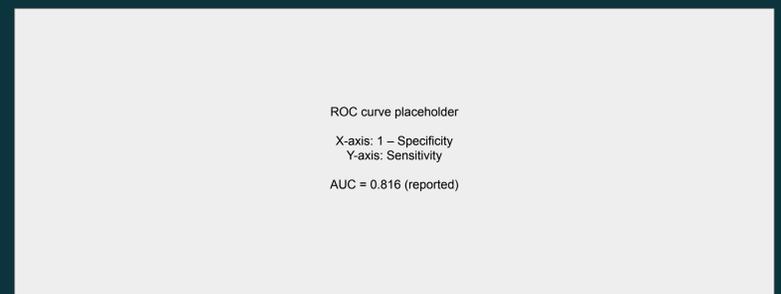


Figure 2. ROC curve illustrating the association between Dynamic Assessment of Situational Aggression (DASA) scores recorded on the day prior and subsequent use of seclusion.

Medication Non-Compliance and Use of Seclusion

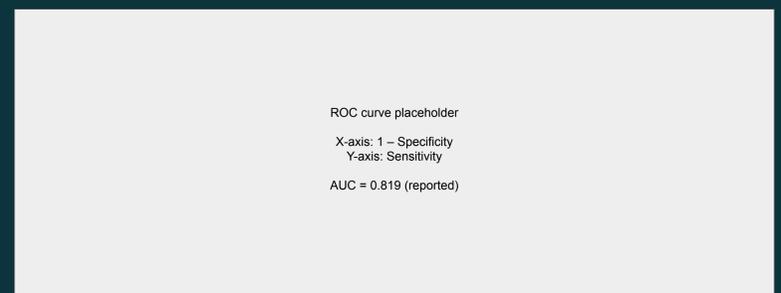


Figure 3. Item-to-outcome ROC analysis demonstrating the association between medication non-compliance and subsequent incidents requiring seclusion.

Discussion

This study demonstrates proportionality in the use of restrictive practices within a high security forensic inpatient setting, with higher severity incidents associated with higher levels of staff intervention. Dynamic risk factors and incident severity were strongly associated with subsequent use of seclusion.

Item-to-outcome analysis provides clinically meaningful insight into contributors to restrictive practices. In particular, non-compliance with medication emerged as a key factor associated with incidents requiring seclusion, highlighting an opportunity for earlier therapeutic engagement and preventative intervention.

Understanding the causal pathways associated with seclusion is essential to informing targeted strategies aimed at minimising restrictive practices while maintaining safety for both patients and staff in high security forensic hospitals.

References

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