# Blurring Boundaries: The Role of Hybrid Green Spaces in Secure Psychiatric Care

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## Summary paragraph

Hybrid Green Spaces in psychiatric intensive care units offer a transformative approach to mental healthcare environments, addressing tensions between therapeutic intent and institutional control. Drawing on our CAMHS PICU case, we demonstrate how (co)produced biodiverse outdoor spaces can actively mediate challenges across risk management, spatial production, and power dynamics.

These spaces foster relationships between human and ecological wellbeing, promoting what we call *Ecological Collective Flourishing*. By enhancing staff wellbeing, creating moments of shared stewardship, and expanding therapeutic possibilities such interventions show that even highly controlled clinical settings can accommodate nature-based programmes safely and meaningfully.

We argue that these hybrid spaces hold significant potential for broader application across psychiatric services, supporting patient-centred care goals, institutional resilience, and environmental sustainability. Our case challenges assumptions about what is possible in secure mental health settings, offering a replicable model for integrating nature-based approaches into psychiatric care without compromising safety protocols.

## 1    Introduction

Psychiatric intensive care units (PICUs) across the UK prioritise safety and risk management, resulting in outdoor environments that are highly controlled and typically deprived of natural features. While these measures address legitimate safety concerns, emerging evidence suggests that the resulting lack of environmental variety and sensory richness may inadvertently increase stress levels for both patients and staff.[1] This approach reflects broader tensions in mental healthcare between institutional requirements and therapeutic environments.[2]

This institutional focus on containment occurs alongside significant workforce challenges in inpatient psychiatric care. Staff face increased workloads due to rising demand that is not matched by workforce growth, resulting in declining retention rates that further impact care quality.[3] Mental health related absences now account for approximately 25% of all NHS staff sick leave[4], with the proportion of staff citing work-life balance as reason for leaving increasing from 4% to 14% in the past decade.[3]

Meanwhile, growing empirical evidence shows that nature-rich environments support psychological wellbeing.[5] Ulrich's[6] study showed that surgical patients with tree views recovered faster and needed less pain medication, helping establish evidence-based design in hospital architecture[7,8] Active engagement with green spaces through gardening can further impact recovery, reduce stress, and improve wellbeing for both patients and staff[6,9]. Joubert et al.[11] found horticultural therapy significantly reduced anxiety compared to standard care, highlighting the clinical relevance of such therapy in inpatient settings. Additional research suggests that gardening therapies, diverse plantings, and other nature-based activities can enhance sensory richness and foster a sense of agency for service users, including those in secure units[12-15].

While preliminary studies suggest Nature-based Programmes (NbPs) may enhance work–life balance in general workplace populations[16], such opportunities remain scarce in high-security psychiatric environments. This gap stems from both physical and institutional barriers. Physically, high-security units are often enclosed by 5.20 m fences with light-blocking privacy screens and anti-climbing measures.[17] Institutionally, outdoor spaces tend to be regarded as peripheral rather than integral to the therapeutic environment by healthcare planners, facility designers, and administrative decision makers.[18,19] Consequently, they often lack thoughtful design and are underutilised for therapeutic programmes. The potential for nature-based resources - including biodiverse planting, sensory gardens, therapeutic horticulture - to support both service users' and staff wellbeing remains largely unrealised in secure settings such as PICUs and forensic units.

PICUs present some of the most complex and resource-intensive environments in mental health care and are under-represented in research, with only a few large-scale studies or Randomised Controlled Trials.[20-22] These environments are characterised by high acuity, short-term, high-intensity care settings, often with higher staff-patient ratios and stricter security protocols, including highly regulated access to outdoor spaces.[22] The focus on risk management means that PICUs may be particularly resistant to therapeutic nature-based programmes. Following Flyvbjerg's[23] view that strategically selected cases can illustrate what is possible under restrictive conditions, we sought to investigate whether nature-based programmes can be conducted in a PICU without compromising safety.[23] This study addresses a critical gap in understanding how biodiverse, sensory-rich outdoor green spaces can be integrated into secure psychiatric settings while adhering to safety protocols. Our project design was informed by the following questions:

- How can secure units integrate biodiverse green spaces?
- How do such spaces expand therapeutic potential?
- How do they reshape staff-patient relationships?

*1.1   Case approach and theoretical framing*
To address these questions, we developed a therapeutic horticulture garden at the tier 4 Child and Adolescent Mental Health Services (CAMHS) PICU at Warneford Hospital, Oxford

Health NHS Foundation Trust, working collaboratively with PICU staff, ex-service users, facility management, and the Oxford Health Arts Partnership (the 'PICU garden project').

We employed a (co)production approach guided by patient and public involvement (PPI) principles, bringing together literature on nature-based programmes (NbPs) for staff in mental health care settings[24] with real-world observational insights.[25] Medical and non-medical staff worked alongside a therapeutic horticulturalist to co-design, plant, and maintain the garden between January and July 2024, supported by the Oxford Health Arts Partnership. All members involved in this project are referred to as co-researchers from this point forward.

## 1.2    Historical Context - Lessons from the past

Green interventions in mental healthcare have historical roots. Nineteenth-century asylums in Europe and North America, guided by the moral treatment movement, commonly integrated access to nature, fresh air, and aesthetically pleasing surroundings as central elements of patient care.[26,27] This turn toward a more 'humane' model of care incorporated therapeutic environments and moral discipline, marking a shift away from earlier custodial approaches focused on confinement and control.[28,29] These historical settings blurred the boundaries between the indoor and outdoor treatment spaces, creating more holistic therapeutic environments that actively shaped healing through sensory, spatial, and environmental connections.[26,30]

The Warneford Hospital, opened in 1826, exemplifies this historic integration of nature with mental health care. Records show that hundreds of trees and shrubs were planted "to beautify the grounds" as part of the pleasant surroundings essential for patient treatments.[30] These therapeutic landscapes incorporated patient participation in maintenance activities, farm work, exercise, and relaxation in the natural environment, all considered essential features of the healing process.[29]

The asylum grounds were deliberately reconfigured through landscaping that served both practical and therapeutic purposes.[31] Patients engaged in groundskeeping and farm work in aesthetically designed landscapes, creating meaningful connections to nature that shaped their treatment experience.[31,32] The design also integrated "airing courts" into the Warneford's architecture, creating secure outdoor access for patients to "take the air," a feature that effectively blurred the conventional boundaries between indoor therapeutic spaces and the healing natural (outdoor) environment.[33,34]

Overcrowding, poor conditions, and mistreatment of patients eventually led to asylums being closed during the 20th century.[35] The subsequent shift towards a biomedical paradigm prioritised biological treatments over more holistic, psychotherapeutic approaches, contributing to the neglect of environmental factors in mental health care.[36] As a result, green and outdoor spaces largely disappeared from inpatient settings. Learning from these historical precedents underscores the critical importance of purposefully designing therapeutic environments that integrate both medical treatment and environmental healing approaches.

## 1.3    Contemporary Context - Applying the lessons

Today's diversity of mental healthcare facilities offers opportunities to thoughtfully re-engage with historical practices that better serve patients and staff.[37] Contemporary inpatient settings can selectively adopt past approaches that fostered safe, supportive, and therapeutic environments without reproducing the surveillance and control mechanisms that characterised institutional asylum models.[38-40] This adaptation allows us to reposition green spaces as integral components of care delivery rather than peripheral amenities. In doing so,

landscapes can be carefully designed for institutional practices and personal healing experiences to meaningfully intersect.

This renewed interest aligns with broader workplace trends. Since the COVID-19 pandemic, green spaces and NbPs have gained momentum in healthcare environments.[41] These programmes have shown success in hospitals and clinics in the UK and beyond, demonstrating positive effects on patient recovery and workplace wellbeing.[41,42]

Organisational psychologists (who study workplace wellbeing) are increasingly interested in workplace green spaces to promote employee wellbeing.[43,44] This is particularly relevant for mental health settings, where staff shortages intensify workplace pressures. Dedicated staff respite spaces become especially important for supporting those who are delivering critical patient care.[24,46] However, secure psychiatric settings face additional barriers due to stricter risk management protocols that limit widespread adoption.

## 2 Case: Therapeutic Green Spaces in a Secure Setting

The 'PICU garden project' was originally initiated by the head of the ward with two main objectives: (1) to enhance staff wellbeing through the development of a staff garden area and (2) to explore the potential benefits of therapeutic green spaces for improving patients' mental health and wellbeing.

Building on these institutional priorities, our case began with a practical question: How might therapeutic gardening work in a high-security PICU? We drew on established therapeutic horticulture principles[14] while remaining open to unexpected findings about human-environment relationships in secure institutional settings. We developed this case at the in-patient tier 4 Child and Adolescent Mental Health Services (CAMHS) Psychiatric Intensive Care Unit (PICU) at the Warneford Hospital, Oxford (UK).

Although many inpatient settings include outdoor areas, they are often not co-designed with the service users or with therapeutic use in mind, limiting their engagement potential and effectiveness.[47] In this case, the horticulture planning and planting was co-produced with medical and non-medical staff and ex-service users in partnership with the Oxford Health Arts Partnership.

The project ran from January to July 2024 through 10 consecutive sessions, integrating the perspectives of medical and support staff including teachers and receptionists, researchers, ex-service users and estate services. Direct service-user involvement was limited due to ethical and operational constraints, but their perspectives were indirectly captured through staff reflections. Our iterative design approach accommodated healthcare schedules through flexible timing and drop-in participation, while addressing practical challenges that included limited resources, seasonal constraints, and risk management requirements.

We gathered insights through an iterative process that triangulated evidence from multiple sources: theoretical literature, historical archives, established therapeutic horticulture frameworks, organisational observations, and semi-structured interviews with five staff members and ex-service users. Casual participant observations during gardening sessions, alongside physical artifacts like garden plans and seeds, revealed how humans, built, and natural entities interacted in practice. This multifaceted approach allowed us to understand both the conceptual foundations and lived experiences of green spaces in this specific psychiatric health care setting.

Through evidence-based horticulture programmes and ecologically appropriate planting[48,49], the project enriched biodiversity in the green space. Staff noted increased biodiversity and sensory richness as evidenced in the PPI interviews: *"I didn't like the feel of the soil, it was dry and disgusting, really gross, I hate that feeling. It's because it's not nice soil, nice soil feels nice – [this] sets my teeth on edge. I liked it because we found loads of worms and that cheered me up, and the plants are going to make the soil better aren't they. There's loads of bees now, there was never anything before, literally it was barren."* These comments suggest a perceptual shift, reflecting increased sensory and ecological engagement.

The project also revealed how boundaries between indoor and outdoor spaces became blurred. Although technically distinct, patients who were unable to access the garden physically could still engage with nature visually. As one staff member observed: *"I have seen some evidence of, you know, progress that has been made in particular supporting a young person who was in long term segregation for a while and becoming very aware of a lovely bed outside the window that was, you know, developing over the summer and it was something to focus on, something to look at and it was really nice."* While segregation is distressing, the garden view temporarily disrupts the sense of enclosure, contrasting with the secure environment and expanding perception beyond confinement.[50]

This visual connection proves particularly valuable for patients in isolation, as another participant noted: *"Then actually to be able to draw on what is safely beyond their reach is really important."* The architectural design facilitates this connection, with *"The room has glass down to the floor, so the outside becomes the inside"* – creating therapeutic sight lines that extend beyond physical barriers.

Staff found the garden provided a different kind of working environment. One co-researcher noted: *"I think that that's the best way to do things, but to get out of that environment and be here in a productive positive collaborating project."* This alternative environment allowed nature-based programmes then to temporarily suspend institutional hierarchies and create new, more collaborative forms of interactions. These spaces are co-shaped through shared stewardship (planting by the staff and patients), fostering a sense of ownership among staff and patients and supporting ecological wellbeing.

However, enhancing green spaces also revealed the vulnerability of therapeutic environments. Some patients pulled plants or littered the garden, illustrating how these hybrid spaces require development and maintenance strategies to be tailored (e.g., through co-design) to the specific contexts and needs of both patients and staff. Rather than static additions to secure settings, these spaces must be continuously shaped through stewardship and shared responsibility. Vulnerability for staff also remains a concern (cf.[51]); our case addresses this through the incorporation of a dedicated staff garden, ensuring that hybrid spaces remain inclusive yet sensitive to institutional and occupational needs.

## 3    Toward a Hybrid Green Spaces Framework: Lessons from the PICU Case

Our case revealed surprising patterns of integration between seemingly oppositional domains, such as green-built, care-operations, and patient-staff. These integrations led us to conceptualise what we term 'Hybrid Green Spaces'. Hybrid Green Spaces are therapeutic environments that blur traditional boundaries between built and natural environments, institutional requirements and therapeutic goals, and patients and staff interactions. Moving beyond established approaches that consolidate these separations, Hybrid Green Spaces enable productive tensions that generate new possibilities for care and for safeguarding highly vulnerable patients. Our analysis identified three key axes along which Hybrid Green

Spaces can help mediate tensions in PICUs: i. axis of risk management, ii. axis of spatial (co)production, and iii. axis of power dynamics.

### 3.1    Axis of Risk Management

This axis addresses the tension between therapeutic intent and institutional security requirements. In secure psychiatric settings, safety protocols often exclude natural elements due to perceived risks, creating sterile environments that may inadvertently increase stress. The plant selection for the PICU garden highlighted this tension. To satisfy safety standards in this high-risk environment, the project could only use operationally approved, low-risk plant species (e.g., non-toxic selections that would not cause a ligature risk).

Instead of accepting the risk requirements as an insurmountable barrier, staff participated in selecting plants, carefully balancing ecological enhancement (biodiversity) and service user preferences (e.g., herbs for cooking and scent) with institutional safety requirements. This co-decision process exemplified how ecological and institutional priorities could be negotiated rather than seen as mutually exclusive. This approach challenges the assumption that safety must exclude natural elements, proposing instead that nature can be integrated within risk-managed environments through careful design and policy negotiation.

### 3.2    Axis of Spatial (Co)Production

This axis addresses the tensions between institutionally controlled spaces and dynamic, collaboratively shaped therapeutic environments. Secure psychiatric settings typically feature rigid spatial arrangements designed for surveillance and control.[17] Fixed garden furniture, restricted access, and predetermined uses usually limits how staff and patients can collaboratively shape their therapeutic environment.

The PICU outdoor area began as a barren space with unsuitable soil and water runoff problems. The transformation involved first solving practical drainage issues by relocating beds away from walls. This was followed by collaboratively designing and implementing plantings by the co-research team. This collaborative process fundamentally changed how the space was perceived and used. As one co-researcher put it: "*It was so barren out there and depressing... so actually having some wildlife there, some plants, some bees, it adds some humanity.*"

The spatial transformation also challenged traditional inside-outside boundaries. The garden created new forms of visual and emotional connection, as one member of staff observed about a patient in segregation: "*The shared experience of looking at something through a window put us completely on a level,*" highlighting how the green space in a secure setting can transcend physical barriers to create therapeutic connection.

Instead of accepting the predetermined spatial arrangement, the garden programme demonstrated how this space could be continuously co-produced through collaborative practices. This challenges conventional approaches that confine therapeutic design to secure and sanitised indoor spaces.[19] The space will continue to grow over time, demonstrating restorative and regenerative potential of both human and nature wellbeing within secure health care settings.

### 3.3    Axis of Power Dynamics

This axis addresses the tension between rigid institutional hierarchies and collaborative therapeutic relationships. Secure psychiatric settings typically maintain clear staff-patient boundaries and hierarchical structures that are designed for safety and control[52], which can limit opportunities for reciprocal, humanising interactions. Power dynamics became visible

during collective gardening sessions. As one co-researcher observed: *"People can't pull rank here; or they can, but maybe on a different basis as well."*

Nature-based programmes can temporarily suspend institutional hierarchies and create new, more collaborative forms of engagement. These spaces are co-shaped through shared stewardship, fostering a sense of ownership among staff and patients and supporting ecological wellbeing. However, the garden also revealed ongoing tensions, as some patients pulled plants, showing that these collaborative processes require continuous negotiation and cannot guarantee 'harmonious' outcomes.

### 3.4    Integrating Three Axes in The Hybrid Green Spaces framework
Across all three axes, the Hybrid Green Spaces framework facilitates productive integrations of apparent oppositions in secure psychiatric settings (Figure 1). Instead of consolidating the separation between built and nature, institutional control and therapeutic benefit, or hierarchical structures and collaborative relationships, these spaces allow for dynamic negotiations of these tensions.

The PICU garden project demonstrates three key principles: ecological and institutional priorities can be negotiated through collaborative decision-making; spatial boundaries can be transcended through visual and emotional connections; and power dynamics can be temporarily reconfigured through shared activities while maintaining necessary safety structures.

Our hybridity framework reconceptualises green spaces in secure settings not as passive design features but as dynamic, co-produced environments that evolve through ongoing interactions between people, place, and ecological processes.[34] Drawing on systems-informed clinical design principles, this approach foregrounds the active role of environment in therapeutic processes.[42,53], positioning these spaces as relational systems that actively shape health outcomes over time.[8,54]



**Hybrid Green Spaces:** Facilitating Productive Integrations of Apparent Oppositions in Secure Care

✳ = Hybrid Green Space

Green *vs* Built

Risk

Space

Care *vs* Operations

Patients *vs* Staff

Power

**Risk**
- Physical security
- Ecological concerns
- Operational

Eco-therapeutic design: Integrating human wellbeing and ecological health in secure psychiatric care.

**Space**
- Therapeutic horticulture
- Landscape design choices
- Maintenance routines

Reconfiguring traditional staff–patient hierarchies by promoting shared engagement in green settings.

**Power**
- Shared experiences in nature
- Role flexibility
- Physical co-presence

Merging clinical and natural spaces to expand therapeutic opportunities beyond standard treatment boundaries.
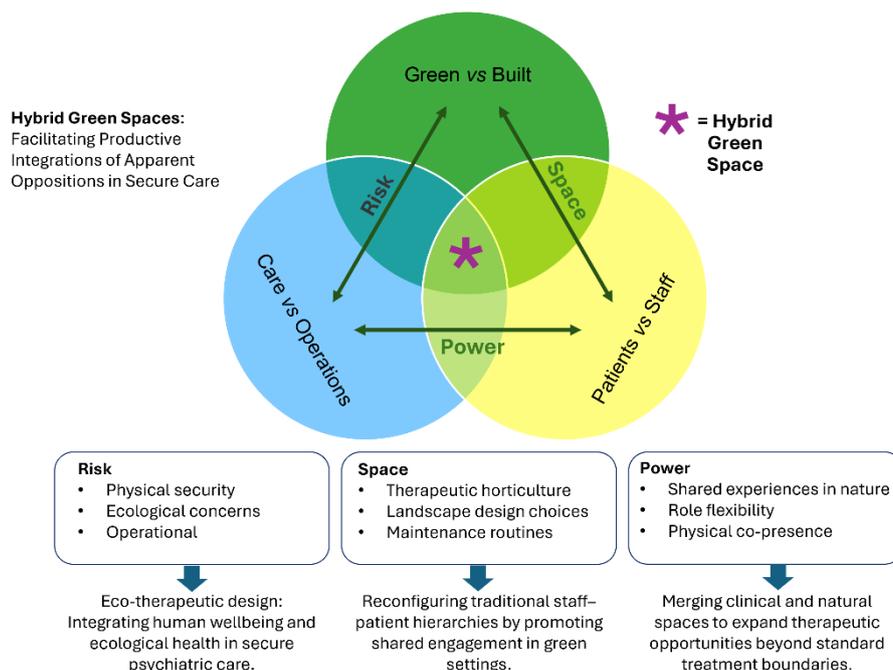
Figure 1 Framework illustrating how Hybrid Green Spaces mediate three key tensions in secure psychiatric healthcare: (1) Green vs Built, (2) Care vs Operations, and (3) Patients vs Staff. The framework shows how Hybrid Green Spaces can reconfigure relationships between human, environmental, and institutional elements through risk management, spatial (co)production, and power dynamics.

## 4    Limitations and Implications

### 4.1    Practical Applications for Secure Psychiatric Settings

Our findings highlight several practical applications for secure psychiatric facilities. Therapeutic gardening fostered meaningful staff connections, potentially addressing retention challenges by providing restorative breaks and non-clinical engagement. Even within strict security protocols, outdoor areas can be reconfigured to serve both therapeutic and ecological functions through careful plant selection and risk-managed design.

Gardening activities created moments where traditional hierarchies between staff and patients could temporarily shift, enabling more collaborative therapeutic relationships through shared tasks that offered a neutral ground for interaction. These practical benefits demonstrate that hybrid green spaces can be implemented in high secure settings without compromising safety protocols, while providing measurable gains for both staff wellbeing and therapeutic engagement.

In response to growing NHS recognition of sustainability and climate resilience as healthcare priorities, we propose Hybrid Green Spaces as intentionally designed environments that support the wellbeing of service users, staff, and the ecological systems within them.[21,55-57]

### 4.2    Limitations and Future Directions

There are several limitations to our study that help contextualise our findings and inform future research. First, the single case design limits generalisability to other secure settings with different spatial configurations, patient populations, and organisational structures. While our example demonstrates feasibility in a highly controlled environment, other types of secure psychiatric facilities may require different implementation pathways.
Second, patient perspectives were gathered only indirectly through staff observation, rather than through direct engagement with service users, potentially overlooking key experiential and affective dimensions. This methodological limitation highlights the need for more inclusive approaches in future research, while reflecting the ethical and practical constraints of conducting research in acute psychiatric settings.

Third, the six-month timeframe (January–July 2024) provides only a snapshot of implementation, limiting our ability to assess seasonal variation, long-term sustainability, or enduring impacts on human wellbeing and biodiversity. Longitudinal research is needed to evaluate Hybrid Green Spaces over time, as both ecological and therapeutic processes often require longer periods to manifest.

Finally, while our conceptual framework draws from diverse disciplines (including spatial theory, therapeutic landscapes, and ecological systems) it requires further validation and refinement through application across a wider range of secure psychiatric settings, including adult services and facilities with varying security levels. Future research should expand both the implementation contexts and methodological approaches, including mixed-methods designs that capture qualitative experience alongside quantitative outcomes, to strengthen the evidence base for hybrid green spaces in secure psychiatric care.

## 5    Advancing Care Models: From Biopsychosocial to Nature-integrated Care

Current care frameworks, while increasingly attentive to environmental factors, remain predominantly human-centred. For example, Gómez-Carrillo et al.[53] propose a cultural-ecosocial framework informed by the 4E cognitive science paradigm ("cognitive science examines how cognition is embodied, embedded, enacted, and extended"[53]), yet its 'eco' component primarily refers to social ecosystems rather than natural ones. While they acknowledge environmental contexts, the framework overlooks critical dimensions of human-nature relationships: it lacks theoretical grounding in biodiversity–mental wellbeing connections, downplays how designed natural environments shape therapeutic performance, omits the restorative potential of caring for living organisms, and fails to recognise how natural systems function as integral components of health-sustaining networks.[14,58-61] This anthropocentric orientation limits opportunities to integrate ecological processes as active contributors to therapeutic relationships.

Our Hybrid Green Spaces approach begins to address this gap by conceptually and practically embedding living ecosystems into therapeutic environments. The PICU garden case demonstrates how hybrid green spaces extend psychiatric care beyond the traditional biopsychosocial model (first articulated by Engel in 1977 as a response to reductionist biomedical paradigms[62]), by explicitly incorporating ecological systems as therapeutic agents. In the PICU garden project, reciprocal care dynamics emerged: staff tended the green spaces, and these spaces, in turn, supported wellbeing through sensory engagement, stress reduction, and meaningful non-clinical activity. Elsewhere, we have described this dynamic as 'Ecological Collective Flourishing'[63], a novel concept describing how human and ecological wellbeing evolve together through mutual reinforcement.

Ecological Collective Flourishing positions natural systems not as passive therapeutic backdrops but as active participants in care. It aligns with the recent terminological shift by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) from 'ecosystem services' to 'Nature's Contributions to People', signalling a move toward relational and culturally co-produced understandings of nature.[64] Within our case, plants, soil, insects, and seasonal rhythms acted as therapeutic agents, providing sensory stimulation, responsive feedback to care (e.g. plant growth), and unexpected yet safe encounters with nonhuman life.

The PICU staff reported positive responses to these ecological interactions, indicating potential for improving workforce wellbeing in high-pressure clinical settings. As global frameworks such as the Kunming-Montreal Global Biodiversity Framework call for robust evidence linking nature and human wellbeing[65], our study offers a grounded, real-world example of how ecological and therapeutic value can be co-produced even in the most risk-managed psychiatric environments. By deliberately bridging clinical and ecological systems, we advance a nature-integrated paradigm that recognises human mental health and wellbeing and environmental health as inherently interconnected and mutually sustaining. By integrating therapeutic, ecological, and institutional dimensions, our findings contribute to an emerging eco-biomedical paradigm centered on human-nature interdependence.


## 6    Conclusion

We have demonstrated that Hybrid Green Spaces, when intentionally designed and managed, can reconceptualise secure psychiatric settings, transforming sterile clinical landscapes into dynamic, co-produced environments that support both human and ecological wellbeing. Our findings demonstrate how therapeutic, ecological, and institutional dimensions, when integrated, enable the emergence of a novel eco-biomedical model that transcends their

individual contributions, revealing human and ecological wellbeing as fundamentally interdependent. By mediating rigid binaries (e.g., green vs built, patients vs staff, care vs operations), these spaces serve to reconfigure institutional priorities, contributing to more integrated and humanized models of care. We argue for intentional hybridity: Hybrid Green Spaces should not emerge passively through fragmented interventions, but through proactive, integrated design. This approach can transform secure settings from purely clinical spaces into therapeutic landscapes that promote wellbeing, stress reduction, and holistic care, aligning with global calls for more humanistic mental health programmes.[1,21,50,66,67]

While further research is needed to optimise planning, resourcing, and evaluation of such places, our findings demonstrate the high potential for positive impact in Hybrid Green Spaces. We suggest that NHS green estate could come to be viewed operationally and politically as essential therapeutic infrastructure in the secure mental health care context. Our findings support policy changes that integrate these spaces as core components of secure healthcare systems. Reintegrating nature into secure settings offers a pathway toward a more sustainable, therapeutic, and inclusive model of psychiatric care – one that ultimately benefits staff, patients, and the environment, and advances a vision of ecological collective flourishing.

## 7    Conflict of Interest
All authors declare no competing interests.

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