DATA SUPPLEMENT

Summary of the studies reviewed

Study	Facility	Intervention	Findings	Conclusion
Bowers *et al* (2006)	Two acute psychiatric wards	Application of the authors' working model for the development of high-therapy, low-conflict psychiatric wards. The model has three central factors: positive appreciation (moral perception in action, compassion), emotional regulation (suppression, emotional equilibrium) and effective structure (routine-direction, objects, conduct). These factors may be developed through psychiatric philosophy, moral commitments, cognitive–emotional self-management, technical mastery, teamwork, skill and organisational support	Comparing the 3 months pre-intervention with the last quarter of the year-long intervention (outcomes were calculated as outcomes per shift to allow comparison), there were clinically significant reductions in the amount of conflict on the wards (e.g. absconding, aggression, self-harm). There was no significant decrease in the use of seclusion, however	Given the reduction in the amount of conflict on the wards, the authors' working model may reduce the frequencies of seclusions in wards that use this patient management method
Donat (2003)	Adult public psychiatric hospital	Multiple interventions over a 5-year period, including changing the criteria for a case to be reviewed from patients exceeding six episodes or 72 h of restraint or seclusion within 1 month to two episodes or 8 h during 1 week; increasing the profile of the case review committee through changing its membership from direct care clinicians to the hospital director, heads of all major clinical departments, a consulting clinical psychopharmacologist and members of a team of behavioural consultants; introducing a team of behavioural consultants to provide advice on treatment plans; increasing the number of standards for behavioural assessments and plans; and improvement of the hospital-wide staff to patient ratio from 2:1 in the first month to 3.3:1 in the last month	Seclusion and restraint use decreased 75% from the first year to the fifth year of the study	Interventions based largely on the review of seclusion and restraint cases and enhancing the development and assessment of treatment plans seem to have been effective in reducing the numbers of seclusions and restraints
Donovan *et al* (2003)	Child and adolescent public psychiatric facility	The intervention was called 'ABCD' after the four core elements of the programme: autonomy, belonging, competence and doing for others. The implementation of ABCD involved cross-disciplinary collaboration; monitoring of seclusion and restraint rates, and comparing them with unit goals; a development committee observing the integration of ABCD within the units and providing staff with positive reinforcement, education and support	Over 2 years the number of seclusion and restraint episodes decreased by 26%	A seclusion and restraint reduction innovation, based on ABCD, seemed effective in reducing the numbers of these episodes
D'Orio *et al* (2004)	Psychiatric emergency service	Interventions were implemented to address two perceived weaknesses in the service: ineffectual management of problematic behaviours and inadequate monitoring of patients. In response to the ineffectual management issues, the managers implemented an emergency response team for behavioural issues, had staff retrained in the prevention of aggressive behaviour and developed a rating scale for use with identifying behaviours that could be precursors to violence or aggression. The monitoring of patients was improved by extending surveillance from four to five cameras	The number of episodes of seclusion and restraint decreased from 65.2 per month for the 9 months before the intervention to 38.1 per month for the 9 months following implementation (the implementation lasted for 4 months between the two 9-month periods)	Identifying and then addressing perceived weaknesses appears an effective method of reduction of the use of seclusion

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Fisher (2003)	State psychiatric hospital	Multiple changes within the hospital, including public support from the hospital's executive director for the initiative of reducing restraint and seclusion rates; administering a survey to staff and patients about the use of restraint and seclusion within the hospital; the implementation of a new state curriculum that focused on identifying patient behaviours that could lead to aggressive behaviours and on using de-escalation methods, rather than on the use of restraints and seclusion; a greater focus on interpersonal respect, reinforced through a guest speaker on the topic, an 8 h education curriculum and hospital policy; the implementation of new state policy requiring restraint and seclusion post-event analysis, with involved staff and their supervisors, and debriefing with the patient and their treatment team; greater use of information management and data analysis to direct the staff's restraint and seclusion reduction efforts; the revised use of pharmacological interventions; and assisting patients to gain greater self-control through using Linehan's dialectic behaviour therapy	There was a 67% decline in the rate of seclusions and restraints over 3 years	An intervention based on an analysis of the hospital environment, staff education, interpersonal respect, strong feedback systems, changing treatments, and with support at senior management and state levels appeared effective in reducing seclusion and restraint rates
Fowler (2006)	Adolescent residential treatment centre	Aromatherapy: participants could request a 'calming blend' of essential oils if they were feeling agitated. This blend was offered through hand massage or direct inhalation	There were 29 seclusions during the 3 months prior to aromatherapy and 20 such events during the 3 months following the introduction of aromatherapy	Aromatherapy may help to calm agitated patients and therefore reduce seclusion rates
Greene *et al* (2006)	Child in-patient psychiatric unit	Implementation of collaborative problem-solving (CPS; Greene *et al*, 2003), a cognitive–behavioural approach for people who work with aggressive children and adolescents. The CPS has three main treatment goals: identification of cognitive factors that may lead to aggression in children and adolescents; building awareness among staff of the three common ways of handling unmet expectations (impose adult will, collaborative problem solve, remove expectations) and the consequences of these strategies on the adult–child interactions; and help adults and children develop their skills in CPS so that the frequency of aggressive outbursts decreases	There were 281 episodes of restraint or seclusion in the 9 months before the intervention and one episode during the 15 months following the implementation of CPS	Collaborative problem-solving seems an effective approach to reducing seclusion when caring for children and adolescents
Kalogjera *et al* (1989)	Three in-patient adolescent psychiatric units	Several interventions focused on the implementation of a therapeutic management protocol. Using therapeutic management, staff classified the adolescents' disruptive behaviours into four stages based on the severity of the acting out. Staff used verbal and behavioural interventions to try to control the adolescents' behaviours at each stage. Concurrent with the implementation of this protocol, staff adopted a new policy on seclusion and restraint, the hospital's seclusion and restraint committee reviewed such episodes and made recommendations for future practice, and in-service education on therapeutic management was provided for staff	Comparing two parallel periods of time pre-intervention (January to May 1980) and post-intervention (January to May 1981) showed a 64% decrease in the number of restraint and seclusion episodes and a 39% decrease in the number of patients needing seclusion and restraint	A therapeutic management protocol, along with a new policy, reviews of seclusion and restraint episodes and in-service training, seemed effective at reducing seclusion and restraint episodes

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LeBel *et al* (2004)	Acute psychiatric units in 60 private and general hospitals and 10 in-patient facilities within a State Mental Health Authority (SMHA)	Multiple interventions by the SMHA, including continued biannual licensing visits, annual clinic visits, and monthly telephone calls to discuss practice and strategies for the promotion of strength-based care and a safety tool; round table discussions on changing clinic cultures and how to implement innovative restraint and seclusion reduction strategies; a best practice conference incorporating presentations on restraint and seclusion reduction, aspects of child and adolescent strength-based models of care, and a role-play of a threatening and aggressive adolescent and a member of staff; the requirement that each clinic develop a strategic plan; restraint and seclusion grand rounds (first series) that incorporated presentations and assistance with refining strategic plans and strength-based approaches; a state-wide conference involving presentations of strategic plans and performance improvement efforts; restraint and seclusion grand rounds (second series) involved linking the efforts of the Departments of Mental Health with those of other child and adolescent state agencies, and to enhance the support for children and adolescents who had trauma histories	Comparing two parallel periods of time pre-intervention (June to August 2000) and post-intervention (June to August 2002) showed decreases in the number of restraint and seclusion episodes for adolescents' units (37.7%), children's units (65.9%) and mixed children and adolescents' units (67.0%).	A state- or district-wide approach to reducing episodes of seclusion may be effective
Mistral *et al* (2002)	High-care psychiatric ward	Multiple interventions based on 'therapeutic community' principles, including improved communication (daily community meetings between staff and patients designed to enable patients to contribute to the planning of ward events, to disseminate information about daily ward activities, and to address barriers between staff and patients); more regular communication between staff and patients about their care plans and to explain the rationales for treatment changes; instigation of regular staff meetings to discuss practical issues, monthly meetings between community staff and ward staff, and weekly meetings, conducted with an outside facilitator, to explore the root causes of ward issues and to develop possible solutions; improved environment (funds were spent upgrading bathrooms and kitchens, laying new carpets, and painting bedrooms and communal spaces); improved safety (staff were issued with personal alarms and trained in risk assessment and techniques for control and restraint; patient assaults on staff were immediately reported to police); and clarity of aims and structure (rules were instigated with regards to drinking alcohol, using illicit substances, smoking and the upkeep of the environment)	The number of seclusions declined between 1996 (n=35), 1997 (n=21) and the first 9 months of 1998 (n=9)	Interventions based on improving the therapeutic environment for staff and patients may be effective at reducing the number of patients placed in seclusion

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Regan *et al* (2006)	Child psychiatric unit	Multiple interventions based on a shift in the unit's treatment paradigm towards a philosophy of child- and family-centred care. Three changes to practice exemplified this shift: a collaborative problem-solving model was adopted in response to the children's behavioural difficulties; the unit was open 24 h a day to parents; and protocols and procedures were adopted that were sensitive to the traumas the children may have experienced	Prior to the intervention there were one or two episodes of restraint or seclusion each day on the unit. Staff had not used restraints since November 2001 (the year the changes were implemented) and had not used seclusion or chemical restraints since February 2002	Implementing a philosophy that focuses on the needs of children and their families seems to have been effective in eliminating the use of seclusion
Schreiner *et al* (2004)	Adolescent in-patient unit	Multiple changes within the unit, including assessment of established restraint and seclusion practices (collecting of baseline data, interviews with staff and patients, observations of crisis events on the unit); changing the systems of the unit (making the reduction of restraint and system usage a priority, describing the benefits to staff of fewer restraints and seclusions); staff education (in-service meetings, reviews that dispelled myths pertaining to seclusion and restraint, reinforcement of unit-wide strategies to reduce restraint and seclusion usage, providing key decision-makers in crisis situations with more training in patient-specific de-escalation strategies and early crisis intervention); modelling of crisis de-escalation techniques by members of the committee responsible for leading these changes; feedback and discussion of restraint and seclusion data to staff on the unit; meetings with patients about the goal of reducing restraints and seclusions, and the potential positive outcomes for patients; reviews of standard therapeutic de-escalation strategies with patients; introduction of a ward reward system for patients if the numbers of restraints and seclusions decreased by 25% during a specific period; focusing on outlier patients (re-evaluation of the treatments of patients restrained or secluded at least three times over a 30-day period, consideration of specific communication and behavioural strategies to help patients cope with crises, practising these strategies in non-crisis conditions); analysing and reacting to data showing restraint and seclusion use patterns	There was a decrease in the monthly number of seclusions from the assessment phase (18.67 per month) to the intervention phase (12.14 per month)	An intervention based on changing the unit's systems, staff education and implementing treatment interventions appeared to be effective at reducing the numbers of seclusions

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Smith *et al* (2005)	Nine state hospitals	Multiple changes within the hospitals including a leadership push to reduce the use of seclusion from hospital staff, community advocates and chief psychiatrists; the state-wide introduction of the 'recovery approach' to caring for patients; improved collection of data on seclusion and restraint, and increased sharing of these data between hospitals; staff training in non-offensive crisis management; employment of new staff; greater patient advocacy from consumer organisations and the state appointment of independent advocates; state policy on the use of restraints and seclusion was revised to restrict the range of situations in which such procedures could be used and how they may be used; the introduction of psychiatric emergency response teams; reductions in the numbers of staff per unit and improvements in staff to patient ratios; the state-wide implementation of a new incident management system, which increased the number of performance indicators; the introduction of second-generation antipsychotic medications; and increased quantity and quality of treatment (e.g. increased use of therapy)	There was a decrease in the seclusion rate (episodes per 1000 patient-days) from 4.23 and 7.20 in 1990 and 1991 respectively to 0.28 in 2000	A concerted effort to change policy and practice, both internally and externally to hospitals, appeared effective in reducing the use of seclusion
Sullivan *et al* (2004)	An in-patient acute psychiatric unit within a hospital	Multiple changes to nursing practice, including rotating staff so they treated people with different severities of illness, assessing patients' needs on a daily basis, providing nursing staff with education (e.g. de-escalation workshops) and debriefing patients following seclusion	Comparing the June to December 2001 period with a similar period 1 year later, the number of seclusions decreased from 48 to 31	An intervention based on nurse care, patient care and nurse education seemed effective in reducing the number of seclusions
Sullivan *et al* (2005)	Adult psychiatric service of an inner city hospital	Multiple interventions including new expectations for staff (these expectations were that patient and staff safety would be increased through reducing the use of seclusion and restraints; that staff would support the patients' engagement in treatment through the use of aggression management interventions that the patients have chosen; that staff would intervene prior to patients losing control; that staff would assist patients to believe that they have control over their behaviours, even when crises occur, and that, with staff support, they can make appropriate choices; that staff would use creative support, rather than control, through employing new methods of intervention such as bending the rules and the respectful use of humour; that staff would address the ways in which patients from different cultural backgrounds express and control anger; that staff would make a paradigm shift from one of staff fear and control to one of patient empowerment and collaborative relationships; and that staff promote the message to patients that 'we are in this together' and 'together we can get through this'); the implementation of a patient violence assessment tool (with sections on the relevant histories of patients and precipitants to violence; how patients tend to display aggression, agitation and violence, either physically or verbally; interventions that patients might find useful at times when they potentially could lose control); and staff training (8 h crisis intervention course, alternatives to restraint and seclusion course, cultural diversity course)	The number of confinement episodes (restraint and seclusion combined) per 1000 patient-days decreased with the implementation of the intervention in 2001. For the years 1998 to 2003, the numbers of confinement episodes per 1000 patient-days were 10.9, 9.9, 12.8, 3.3, 1.7, and 3.2 respectively	An intervention primarily based on placing new expectations on staff regarding how they should engage with aggressive patients seemed effective in reducing the use of seclusion

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Taxis (2002)	State psychiatric facility	Multiple interventions during a 42-month period: assault programme and other individualised care programmes (an assault programme was developed to provide structured, individualised attention to patients to support them to develop non-violent coping skills; other specialised programs were also run); staff education (training in the assessment of behavioural indicators of impending violence, collaboration and verbal de-escalation techniques, crisis intervention, diversional activities, ethical considerations in restraint and seclusion, one-on-one discussions, problem-solving exercises, skills for improved documentation, therapeutic interventions with patients who had personality disorders, use of medications with aggressive patients); patient education (training for patients in self-care and self-monitoring during upsetting events, including anger reduction and stress management strategies; structured debriefing sessions following periods of restraint or seclusion); environmental alterations (redesigning the 'quiet room' to make it more comfortable, to give patients a place that is conducive to self-control and self-monitoring), communication feedback loop (evaluating all incidences of restraint or seclusion over a 14-month period, analysing these data and feeding the information back to charge nurses; from this information targeted educational interventions on less restrictive strategies could be developed and implemented); administrative and programmatic changes (implementation of an audit tool that addressed the areas of justification for restraint or seclusion, assessment of patients, care during restraint or seclusion, care immediately following the episode, and documentation)	There was a 94% reduction in the number of restraints and seclusions between June and August 1996 and December 1999 and February 2000	Interventions based on education, changing the physical environment, and evaluation and feedback appear to be effective in reducing the numbers of restraints and seclusions