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Effects of a Psychiatric Intensive Care Unit in an Acute Psychiatric Ward.

Thesis for the degree of doctor medicinae

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Norwegian University of
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1: Vaaler AE, Morken G, Linaker OM. Effects of different interior decorations in the seclusion area of a psychiatric acute ward. Nordic Journal of Psychiatry 2005; 59: 19-24.

2: Vaaler AE, Morken G, Fløvig JC, Iversen VC, Linaker OM. Effects of a Psychiatric Intensive Care Unit in an acute psychiatric department. Nordic Journal of Psychiatry 2006; 60: 144-149.

3: Vaaler AE, Morken G, Fløvig JC, Iversen VC, Linaker OM. Substance abuse and recovery in a Psychiatric Intensive Care Unit. General Hospital Psychiatry 2006; 28: 65-70.

4: Vaaler AE, Iversen VC, Morken G, Fløvig JC, Linaker.OM. Short-term prediction of threatening and violent behaviour in a Psychiatric Intensive Care Unit. Submitted.

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Definitions.

Seclusion: Placement and retention of an inpatient in a bare room in order to contain a clinical situation that may result in a state of emergency.

Physical restraints: Staff restricts and holds the patient manually.

Mechanical restraints: Use of belts, handcuffs etc which restrict the patient's movements or totally prevent the patient from moving.

Chemical restraints: The use of medication to control agitated states.

Abbreviations

PICU: Psychiatric Intensive Care Unit

PANSS: The Positive And Negative Syndrome Scale for Schizophrenia

S-GAF: The Global Assessment Scale Split version

BVC: The Broset Violence Checklist

SOAS-R: The Staff Observation Aggression Scale-Revised

CPT: The European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment

Summary

The psychiatric acute departments are intensive units serving patients with a broad spectrum of psychiatric conditions. Patients with the most florid psychiatric symptoms are admitted to Psychiatric Intensive Care Units (PICUs). These units are supposed to provide the necessary diagnostic and acute therapeutic help, control inappropriate behaviours, and provide the services in an environment which assists the patients' recovery and is acceptable to patients, health workers and the general society.

PICUs are criticised for poor environments, high levels of coercion and lack of evidence base from controlled trials or post occupancy evaluations. Long term studies of the rate of seclusion indicate no decrease in spite of changing political attitudes and hospital environments. There is a need for new methods to treat violent or threatening incidents in psychiatric wards. Norwegian PICUs use segregation nursing with the patients placed in separately locked areas with staff. This model may be an alternative to seclusion. Controlled trials regarding effects of principles and facilities for such treatment are lacking. The general aim of the present study was to investigate effects of facilities for segregation, and several assumed risk factors in a Norwegian PICU.

The current thesis is based on data from 118 consecutively admitted patients to the PICU at St. Olavs University Hospital, Trondheim, Norway. The thesis has the following conclusions:

Main conclusions

1: Interior and furnishing like an ordinary home in the PICU create an environment with comparable treatment outcomes to the traditional dismal interior and has positive effects on many patients' well being. Patient self-rating were significantly in favour of the ordinary home interior compared to the traditional interior

2: The principles of patient segregation in PICUs have favourable effects on behaviours associated with and the actual numbers of violent and threatening incidents. The changes in assessments of behaviour measured by differences in BVC ratings from baseline (admittance) to day 3 were significantly in favour of segregating the patients in the PICU compared to not segregating the patients in the same area. There were significantly lower reported incidents of violent or threatening incidents when using the PICU as a segregation area compared to not using the PICU as a segregation area.

3: In PICUs substance use is associated with favourable outcomes compared to patients not using substances. There was a significant difference in the changes of GAF-S –symptom ratings from admittance (baseline) to day three between the patient groups with or without a substance use diagnosis. The largest increase was in the patient group with a substance use diagnosis indicating more reduction of symptoms.

4: Threatening and violent incidents are not common acute manifestations of recent substance use in PICU populations. There was no significant difference in the number of threatening or violent incidents between the patient groups with or without a substance use diagnosis.

5: Substance use predicts shorter length of inpatient stay in PICU populations. The mean length of stay in the PICU was significantly shorter in the patient group with a substance use diagnosis compared to the patient group without a substance use diagnosis.

6: In PICUs prediction of short-term aggressive and threatening incidents should be based on clinical global judgement, and instruments designed to predict short-term aggression in psychiatric inpatients. In the hierarchical multiple linear regression analysis the global clinical evaluation from the physician on duty, the nurse clinicians' global evaluation of "intensity of testing out and pushing limits", and the observer rated scale scoring behaviours predicting imminent violence in psychiatric inpatients (BVC), were the factors positively associated with short-term threatening and violent incidents.

7: The predictive properties for BVC in the PICU-setting are satisfactory for the first three days after a single rating at admittance.

Additional conclusions:

1: Patients who have experienced segregation settings like seclusion have desires for alternative treatment conditions. These desires are to a large extent met by Norwegian PICUs. These PICUs are effective.

2: In the architecture and design of PICUs it is important to take into consideration the possibilities for segregation of patients.

1.0 General introduction.

1.1 History.

Principles of treatment of behaviourally disturbed patients have been described from ancient times. Soranus gave a classic description of it in the second century A.D. He suggested: "*Have the patient lie in a moderately light and warm room. The room should be perfectly quiet, unadorned by paintings…do not permit many people, especially strangers, to enter the room, and instruct the servants to correct the patients' aberrations while giving them a sympathetic hearing…And if the patient begins to get out of bed and cannot easily be restrained, or distressed especially because of loneliness, use a larger number of servants and have them covertly restrain him by massaging his limbs: in this way they will avoid upsetting him. If the patient is excited when he sees people, bind him without doing any injury*" (Conolly 1964, Hodgkinson 1985). Soranus focused on the need to control the patients' behaviour and the reduction of sensory and emotional stimuli. These measures should be conducted in an ethical acceptable manner. In 1794 Philippe Pinel broadened these concepts in his "Memoir on Madness". He appealed for asylums where the mentally ill could be treated with decency, gave optimistic prognoses and principles for therapy, and pointed out the balance between safety, patients' rights and the nonpunitive use of coercive measures: *"The true principles of managing the insane in a psychologically sensitive manner are also well understood…I mean a kind of supervision adapted to the danger of their madness, the prevention of dangerous consequences of their impetuous outbursts without any mistreatment. If a*

madman suddenly experiences an unexpected attack and arms himself…, the director – always mindful of his maxim to control the insane without ever permitting that they be hurt – would present himself in the most determined and threatening manner but without carrying any kind of weapon…At the same time the servants converge on him at a given signal, from behind or sideways, each seizing one of the madman's limbs…Thus they carry him to his cell while thwarting his efforts and chain him if he is very dangerous or merely lock him up…The employees are expressly forbidden to retaliate even if they are hit..(P. Pinel, 1794, translated by Weiner (Postel 1981, Weiner 1992).

The last fifty years models of psychiatric care have been based on the ideal of a therapeutic milieu or community. There has been a general progression towards an open ward policy. Together with major advances in psychopharmacology this has changed the treatment and care offered in psychiatric facilities (Angold 1989, Greenblatt et al 1980, Crowhurst & Bowers 2002). Altered treatment has led to an area of deinstitutionalization, and the psychiatric in-patient care is now mainly designed for short-term treatment of the severely mentally ill (Wing 1981).

1.2 Patient populations in psychiatric acute units and Psychiatric Intensive Care Units.

The psychiatric acute departments have become intensive units serving patients with a broad spectrum of psychiatric conditions (Breslow et al. 2000). Patients with most florid psychiatric symptoms are admitted to Psychiatric Intensive Care Units (PICUs) (Beer et al. 2001, Dix 2005). The typical

contemporary PICU patient presents in severe crisis often complicated by substance use, polypharmacy, behavioural dyscontrol and multiple axis 1 diagnoses (Zealberg & Brady 1999).

The term PICU has been used in the US and Western Europe for the last 30 years. It was first used by Rachlin in 1973. He analysed the need for a closed ward in an open hospital opened 1970 in New York (Rachlin 1973). The need for PICUs progressed parallel to the shift towards open ward policy. A minority of acutely disturbed and behaviourally disordered patients needed treatment not offered in open wards. PICUs were a way to provide theses patients with relevant environments and resources (Crowhurst & Bowers 2002). PICUs were meant to be “locked wards” for local patients, many of whom had not offended but needed a degree of security to help effectively manage problematic behaviours. PICUs specialize in the short term intensive care and treatment of particularly disturbed patients (Ryan & Bowers 2005). PICUs are facilities that generally have 12-15 beds, and a high nurse to patient ratio (Beer et al 1997). The size and architecture of PICUs differ, but generally the trends are like in the UK where large Victorian institutions have been decommissioned in favour of new smaller built accommodations (Dix 2005). Many PICUs have been developed by local services and there have been no national guidelines.

Important ambitions for a PICU, aside from providing the necessary diagnostic and acute therapeutic help, is to control inappropriate behaviours, and provide its’ services in an environment which assists the patients’ recovery and is acceptable to patients, health workers and the general society. This

combination of efforts may sometimes seem contradictory, but a continuous strive towards these ideals is demanded.

1.3 Aims for treatment in psychiatric acute units and PICUs.

Psychiatric acute units and PICUs focus on acute treatment, function and behavioural disturbances. Psychopharmacology (Cornwall et al 1996, Hilliam & Evans 1996, Raja & Azzoni 2000), different forms of psychotherapy (Crowhurst & Bowers 2002, O´Brien & Cole 2004), and a therapeutic milieu are cornerstones in the treatment. Different levels of segregation are commonly used as management techniques. Primarily segregation is used for containment of patients with problematic behaviours. Patients and staff need to be protected from impending or further violence generated by disturbed patients. The disturbed patients themselves must be protected against self-injury and the potential consequences of injury done to others such as guilt or reprisal from injured parties. Secondly it is used to obtain a decrease in sensory and emotional input (Gutheil 1978, Hodgkinson 1985). The latter is based on the belief that certain patients suffer from excessive mental activity, which is increased by external stimuli (Mason 1993). The need for decrease in sensory stimuli stems from the hypothesis that psychotic patients have an increased sensitivity to sound, smell and touch. Disturbed patients may also be vulnerable to emotional demands in relationships with staff and other patients. Particularly with paranoid patients such demands may be open to misinterpretations. Segregation restricts such demands. Segregation is thus seen both as an emergency management procedure and a treatment technique.

Psychiatric acute wards use different segregation procedures. It is common to have either seclusion rooms or separation areas separated from the other parts of the wards. The segregation procedure differs from keeping the patient alone in the seclusion room to using segregation nursing, placing the patient in a separately locked area with staff.

1.4 Factors affecting treatment.

The influence of the ward atmosphere on the treatment of psychiatric in-patients has been acknowledged for decades. Psychological, social, and physical aspects of the ward milieu affect treatment outcome and patient satisfaction (Middelboe et al. 2001, Friis 1986, Melle et al. 1996). Patients in PICUs are also influenced by a complexity of environmental, social and psychological factors (Crowhurst & Bowers 2002). Physical environment, psychosocial climate, bed numbers, admission criteria, staff numbers, education of staff etc. are factors affecting treatment.

1.5 Ethical considerations regarding treatment in acute psychiatric facilities.

Segregation of patients raises ethical and legal questions. Different authors have indicated that seclusion may have both potentially beneficial (Gutheil 1978) and destructive (Hodgkinson 1985, Pilette 1978) effects. In a review of

seclusion Fisher (1994) found support for the assumptions that seclusion prevented injury and reduced agitation, but it could have serious deleterious physical and psychological effects on patients and staff. Violent behaviour or threats of violence are commonly accepted indications for coercive measures (Angold 1989, Fisher 1994), but often coercion like seclusion is used to control agitation or disorientation (Heilbrun et al 1995, Kaltiala-Heino et al 2003). In most studies young, male patients suffering from psychosis or personality disorders have been most likely to be secluded or restrained (Betemps et al 1993, Fisher1994). In a Norwegian population restraint was shown to be targeted at young, male non-psychotic patients, while seclusion was used for older, male patients with an organic, psychotic disorder (Wynn 2002). Patients tend to consider seclusion as punishment and a therapeutic measure with little value (Tooke & Brown 1992).

To manage violent and disruptive behaviours acute units and PICUs also use chemical, physical and mechanical restraints. Mechanical and physical restraints have both been reported to be associated with serious side effects and death of patients (Mohr et al 2003, Hem et al 2001, Paterson et al 2003). In a recent questionnaire study from 51 psychiatric emergency services in the US, Allen & Currier found that restraint was used with similar frequencies in rural areas, urban centres and university-based programmes (7-12%). Staffs generally agree that patients recall and have adverse reactions to restraints (Allen & Currier 2004).

During the last years there have emerged new legislations, recommendations, court cases and professional guidelines to control the use of coercive

measures in psychiatry. The recurring message in all of these guidelines is the need to practice caution when applying seclusion or restraints (Appelbaum 1999, Dyer 2003, Sailas & Wahlbeck 2005). The European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment (CPT) considers seclusion and restraints matters of particular concern given the patient population and potential for abuse. The CPT considers that seclusion is a practice which must be abandoned within a context of modern psychiatry (Council of Europe 2005).

1.6 General problems in acute psychiatric practice

In spite of international recommendations use of seclusion and restraints continue. Long term studies of the rate of seclusion indicate no decrease in spite of changing political attitudes and hospital environments (Crenshaw et al 1997). There is a need for new methods to treat violent or threatening incidents in psychiatric wards (Sailas & Wahlbeck 2005).

There has been a lack of evidence base and theoretical underpinning of the treatment in psychiatric intensive care (Dix 2005, Sailas & Fenton 2001). Many PICUs are criticised for poor environments, high levels of aggression and unsophisticated approaches to treatment (Zigmond 1995).

Patients, therapeutic interventions, structures and management of PICUs have been described (Beer et al 2001, Crowhurst & Bowers 2002). Controlled trials or post occupancy evaluations regarding effects of PICUs are lacking.

2.0 Introduction to the present study.

Different cultures have varying attitudes towards and procedures for segregation of behaviourally disturbed patients. In many countries seclusion is practised similar to ”solitary confinement” with the patient alone in a padded room. Norwegian segregation practice is different with the use of segregation nursing. In this procedure the patients are placed in separately locked PICUs with staff. In these PICUs the patient are virtually never alone. The principles of stimulus reduction and segregation from other patients are quite similar to other segregation settings.

Segregation nursing like the model from Norwegian PICUs may be an alternative to seclusion. Controlled trials or post occupancy evaluations regarding effects of principles and facilities for such treatment are lacking.

2.1 Facilities for treatment

The few studies published indicate that the physical environment in which treatment occurs has impacts on treatment processes and outcomes, and that there are interrelationships between physical environment and behaviour (Corey et al 1986, Davis et al 1979). Former studies indicate that altered physical design variables may be associated with favourable perceptions of ward atmosphere, and have therapeutic value (Whitehead et al 1984). Two studies have shown that redecorating psychiatric wards in a homely manner tend to lower both threatening behaviour and vandalism (Christenfeld et al

1989, Wilson et al 1983). Similar effects may be observable in other parts of society like schools, public houses, cinemas and apartments (Newman 1973).

2.1.1 Effects of interior decorations

The interior design and furnishings in areas for segregation in psychiatric acute wards are influenced by the wish to reduce the external stimuli and maintain safety. These areas are sparsely furnished with windows lacking curtains, naked walls without paintings or decoration, and living rooms without sources of stimuli like TV, radio, newspapers and flowers. Though the interiors differ between hospitals, these environments can often be regarded as hypostimulating and alienating (Niveau 2004). Reduction in sensory and emotional input may lead to relative sensory deprivation. Studies on sensory deprivation on psychiatric patients indicate that some patients may deteriorate in hypostimulating environments (Freedman & Greenblatt 1960).

The interior design and furnishings of PICUs, separation areas or seclusion rooms are sparsely studied (Crowhurst & Bowers 2002). The description given by Soranus 2000 years ago still summarizes the principles of design in many present facilities (Hodgkinson 1985). In 1856 John Conolly described a room designed for violent or extremely excited patients (Angold 1989). Gutheil & Daly (1980) have indicated clinically based principles of seclusion room design focusing on “identifying the maximum stresses it will endure and building it to endure them over long periods of time”. Dix & Williams have given a review of design of PICUs with recommendations for e.g. layout, security, observation and safety (Dix & Williams 1996).To our knowledge no controlled studies or post-occupancy evaluations have been carried out.

CPT has in some cases defined seclusion as a form of ill-treatment because of poorly ventilated seclusion premises, no means for the patient to contact staff, unsuitable bedding, lack of windows and proper sanitary conditions (Council of Europe 2005).

2.1.2 Effects of segregation

There are lack of controlled studies evaluating the effect of segregation and seclusion (Sailas & Fenton 2001, Wright 2003). Some studies have reported no association between crowding and aggression (Hardie 1999, Lanza et al 1994), while others have reported that increased inpatient numbers lead to more aggression against both staff and other patients (Kumar & Ng 2001, Ng et al 2001, Owen et al 1998, Palmstierna et al 1991). Excessive stimuli and environmental stress are reported to be associated with increased tendency towards violence (Hodgkinson 1985, Morken et al 1999).

Effects of ward space and architecture are sparsely studied. Palmstierna et al found that patients with schizophrenia were more likely to be aggressive in a crowded ward (Palmstierna et al 1991). In a second study the same authors did not find a decline in the frequency of aggression in spite of a reduction of the number of beds by 50% (Palmstierna & Wistedt 1995). Nijman were unable to document a decline in aggressive incidents after extending space in a ward (Nijman & Rector 1999).

2.2 Effects of substance abuse.

Studies from the US indicate that around 50 % of service users with mental illnesses also have substance use problems (Regier et al 1990). Prevalence rates are higher in inpatient populations and emergency services settings (Ridgely & Johnson 2001). European studies generally report somewhat lower prevalence rates (Phillips & Johnson 2003). Data from our own catchment area shows that 32 % of the patients admitted to the acute department suffer from substance use disorders (J. C. Fløvig, personal communication). In populations of psychiatric in-patients substance use has been found to interfere with the expression and resolution of symptoms of psychiatric disorders, to induce or influence acute behavioural changes and to have significant effects on treatment outcome and costs (McKeown & Liebling 1995, McNiel et al 1988, Sanguineti & Brooks 1992, Zealberg 1999). The findings in previous studies indicate that substance use among psychiatric in-patients is associated with hostility and assaultiveness (Drake et al 1993, Sandford 1995).

Studies of substance abuse conducted in PICU populations are sparse. In PICUs and emergency services substance use patients constitute a very heterogeneous patient group, spanning from patients with independent mental disorders complicated by substance use to patients with psychoactive substance use induced disorders only (Lehman et al 1994). A study from two PICUs and nine open acute wards in inner London indicates the frequency of substance use in PICUs (Phillips & Johnson 2003). Eighty-nine% of the patients reported to have had used illicit drugs or alcohol on the ward during a previous admission, and 83% had used substances during the current admission.

2.3 Threatening and violent incidents.

Threatening and violent behaviour by psychiatric inpatients is a major concern in psychiatric practise. Aggression has negative consequences for patients and staff. Some studies indicate it as an increasing problem (James et al 1990, Noble & Rodger 1989). Reduction of severity and incidence of threatening and violent incidents is important in order to improve quality of care in psychiatric facilities. Prediction of violence is therefore important in order to initiate preventive measures. Risk factors, predictors and accuracy of predicting violent or threatening incidents among psychiatric inpatients are widely described (Steinert 2002).

In PICUs, emergency services and acute wards violent incidents are frequent and short-term predictions of violence important (Walker & Seifert 1994). In these settings predictions based on clinical global judgement from experienced staff, or instruments designed to predict short-term aggression may be better than actuarial data drawn from past medical and social history, treatment conditions, behaviours and psychopathology (Nijman et al 2002, Bjørkdahl et al 2006).

3.0 Research questions

The general aim of the present study was to investigate effects of a Norwegian PICU with main foci on facilities for segregation, effects of substance abuse and prediction of violent and threatening incidents.

The thesis aims at answering the following questions:

1: Is it possible to change the hypostimulating, dismal interior decorations with pleasant, stimulating interiors? The aims of the first study were to compare effects on symptoms, behaviours, and treatment in patients who were admitted to two different interior decorations.

2: Is segregation important? The aim of the second study was to compare the effects on symptoms, behaviours, and treatment in patients who were admitted to a PICU with or without a segregation area.

3: How important is substance use in the PICU? The aims of the third study were to investigate differences in symptoms, behaviours, therapeutic steps taken, and length of stay in the PICU between patients with or without a substance use diagnosis.

4: We also wanted to investigate possible predictive factors for violent or threatening incidents during the first three days in the PICU population.

4.0 Materials and methods

4.1 Recruitment of patients.

The acute department of Østmarka Psychiatric University hospital has a catchment area of 140000 inhabitants both from the city of Trondheim (50%) and rural areas (50%) in Sør-Trøndelag County. About 700 patients older than 18 years suffering from acute psychiatric conditions are admitted each year. All acute admissions from the catchment area are received in one of the hospitals' two equal, closed acute wards. Acute admissions to other psychiatric hospitals occur only when inhabitants temporarily reside outside the catchment area at the time of admission. Only patients with acute psychiatric conditions are admitted to the department. Patients with intoxication alone are admitted to separate acute, short-term substance abuse treatment facilities.

4.2 Setting

The study ward consists of an ordinary closed ward area (310 m^2) and a PICU area (190 m^2). The main entrance leads to the ordinary area of the ward consisting of two double patient rooms, two single patient rooms, staff and social rooms arranged along a corridor. In the end of the corridor a locked door separates the PICU area (Fig 1) from the ordinary area of the ward.

The PICU area consists of two wings with sitting room, bathroom, WC, and two single patient rooms in each. The wings are separated by an entrance area, a dining room and a staff room in the middle. Two to four patients and

two to three nurses are present in the PICU area. The patients stay mostly in the wings together with nurses, and contact with other patients is limited. The PICU area thus limits emotional and sensory stimuli and provides segregation from other persons.

The wards had been renovated four years prior to the study. They were well kept and had few signs of damage. Before the study both wings had traditional, sparse, hypostimulating interior design and furnishings. As part of the study one of the wings was redecorated and refurnished. The aims were to make it look, as much as security permitted, like an ordinary Norwegian home.

4.3 Design

Paper 1 is a prospective, semi-randomized clinical trial with control group. The patients were allocated to the refurbished wing or to the traditional wing in the PICU by a predetermined rule: They were admitted to the wing with fewest patients, or with even numbers, to the wing which did not receive the previous patient. While this is not true randomization, it does deprive the staff the power to influence the composition of the groups. In addition; since it is not obvious that this allocation scheme will skew group composition in any particular direction it may serve several of the purposes of randomization.

Paper 2 is designed as a prospective “quasi-experimental” study, where two comparable groups of patients are given two different types of treatment. The group assignments are not created through randomization. Patients entered

the different groups based on which period of time they were admitted to treatment.

Paper 3 is a descriptive longitudinal study with control group based on the patients identified in paper 2. The patients who fulfilled criteria for any substance use disorder according to ICD-10 Diagnostic criteria for research (F 10.00 – F 19.99) (WHO 1993) were allocated to the study group regardless of other diagnoses. The patients who did not fulfil criteria for any substance use disorder, constituted the control group.

Paper 4 is a descriptive longitudinal study with control group based on the patients identified in paper 2. The patients who had a threatening or violent episode during the stay as measured by the SOAS-R (Nijman et al 2005, Palmstierna & Wistedt 1987), constitute the study group. The rest constitute the control group. Clinical data at admittance are related to the outcome measure.

4.4 Study populations

In the periods from November 13th 2000 to March 25th 2001 (inclusion 1) and from October 1st 2001 to March 21st 2002 (inclusion 2), 56 and 62 patients were included. One patient was excluded due to senile dementia.

Paper 1 is based on the patients from inclusion 1. The patients were admitted to a PICU with closed segregation conditions. The door between the ordinary area and the PICU area was permanently locked, and the doors between the entrance and the wings in the PICU area were permanently closed (Fig 1).

The numbers of patients semi-randomized to refurbished and traditional wings were 31 and 25.

Paper 2 is based on patients from both inclusions. The patients in inclusion 2 were treated with the door between the ordinary area and the PICU area removed, and the doors leading to the wings kept permanently open (Fig 1). Thus no patients were segregated during inclusion 2. The patients from inclusion 1 function as control group.

Paper 3 is based on patients from both inclusions. The numbers of patients with and without a substance use diagnosis were 43 and 75.

Paper 4 is based on patients from both inclusions. The first three days a total of 3 (inclusion 1) and 19 (inclusion 2) violent or threatening incidents were recorded among 3 (inclusion 1) and 10 (inclusion 2) patients (11%).

4.5 Procedure

During both inclusions all patients admitted to the acute ward were evaluated by the physician on duty. The patients evaluated to be in need of stay in the PICU were included in the studies except patients with dementia, mental retardation or autism to a severe degree, and patients not speaking Norwegian or English. Criteria for discontinuation were different in the two inclusions. In the inclusion 1 condition patients who reacted verbally or physically negative in altered interior, or did not improve according to GAF

score after 10 days, were to be discontinued and admitted to the other ward. In the inclusion 2 condition patients in absolute need of segregation were to be discontinued from the study and segregated in the patient's room together with staff.

The patients' needs for stay in PICU were rated on a scale with scorings1-4 (4 representing absolute need). The reasons for PICU were recorded on a scale with four categories (patient's own wish, need of close observation, stimuli reduction or control of behaviour (Appendix 1)).

To estimate changes in symptoms of psychopathology, function and behaviour we used The Positive And Negative Syndrome Scale (PANSS) for schizophrenia with time criterion the last 24 hours (Kay et al 1987), the Global Assessment Scale Split version (S-GAF), and the Broset Violence Checklist (BVC) (Almvik & Woods 1999). The patients were assessed at admittance (baseline), day 3 and at discharge from the PICU (end-point). Specially trained ward nurses did all the ratings.

The decision to transfer a patient from the PICU area to the ordinary area was a joint decision in the ward staff. In both inclusion 1 and inclusion 2 conditions patients were transferred to a patient room in the ordinary area. "Length of patient stay" was the total length of stay in the PICU area for all the patients.

For patients who were discontinued from the study scorings at the time of discontinuation functioned as end point in every measurement except "Length of patient stay".

Diagnoses according to ICD-10 Diagnostic criteria for research (WHO 1993) were set by consensus in the department's staff, including at least three specialists in psychiatry of whom at least two personally knew the patient.

4.5.1 Instruments

BVC is a six-item observer-rated scale for scoring behaviours in psychiatric in-patients (Busch-Iversen et al 1994, Linaker & Busch-Iversen 1995). It assesses the presence or absence of six behavioural states: confusion, irritability, boisterous behaviour, verbal threatening, physical threatening, and attacking objects. The instrument includes short definitions of the six phenomena, and each of the six items is scored for its presence (1) or absence (0). Studies in different in-patient settings have yielded satisfactory predictive accuracy (Abderhalden et al 2004, Almvik et al 2000, Bjørkdahl et al 2006). Higher BVC scores predict imminent violence.

Violent or threatening incidents were recorded with Staff Observation Aggression Scale-Revised (SOAS-R) (Nijman et al 1999, Palmstierna & Wistedt 1987). The SOAS comprises five columns pertaining to specific aspects of aggressive behaviour (i.e. provocation, aggressive means used by the patient, the target of aggression, consequences and measures taken to stop aggression). The SOAS – R has a severity scoring system ranging from 0 to 22 with higher scores indicating greater severity. Reviews of studies of psychometric properties indicate fair inter-rater reliability and validity for SOAS assessments (Nijman et al 2005).

The Positive And Negative Syndrome Scale (PANSS) for schizophrenia is a widely used 30-item instrument measuring positive psychotic, negative and

general psychiatric symptoms in patients primarily suffering from schizophrenia (Kay et al 1987). The psychometric properties of the instrument are evaluated in several studies, and the main results shows that the PANSS scorings are normally distributed, they have good inter-rater reliability; and the positive and negative syndromes are independent constructs with their respective subscales holding high concurrent validity in relation to other specific scales designed to measure negative or positive symptoms (Peralta & Cuesta 1994). Usually the time criterion in PANSS assessments is the recent week. Due to the fast changes in symptoms in the PICU, we chose time criterion the last 24 hours.

Since psychometric properties of The PANSS used in a PICU-population with time criterion last 24 hours is not previously tested, Hansen & Strand evaluated this in a separate pre-study. Through scorings of 3 video-taped patient interviews (PANSS training 1989) and assessments of 12 consecutively admitted in-patients, the trained ward nurses demonstrated excellent inter-rater reliability both for total PANSS sum, sums of positive (Pearson's r= 0.96), negative (r= 0.84) and general subscales (r= 0.87) as well as the different 30 single items (Hansen & Strand 2000).

S-GAF is based on DSM-4's GAF (APA 1994) and is a two-item scale measuring global symptoms and functioning separately. The psychometric properties of the S- GAF are not investigated properly though the scale is widely used. The one item GAF with combined evaluation of symptoms and function is widely investigated. The psychometric properties are found to be

satisfactory to measure changes and outcomes at the group level (Friis et al 1993, Melle 2000, Soderberg et al 2005, Yamauchi et al 2001).

In inclusion 1 the patients rated their treatment satisfaction on an 8-item visual analogue scale with scorings 0-10 (10 representing the best value) immediately after discharge from the PICU (Appendix 3). This scale also has an English version (Appendix 4). The psychometric properties of these instruments are not tested.

In paper 4 the item “physician’s prediction” was constructed by combining the two items at physician on duty’s evaluation at admittance. The item “need for PICU” has a scale with scorings 1-4 with increasing value indicating increasing need. The item “reason for admittance to PICU” has four categories: 1: patient’s own wish, 2: need of close observation, 3: reduction of stimuli, or 4: control of behaviour. “Physician’s prediction” is an index defined by giving all the patients from category 4 (control of behaviour) the scorings on “patients’ need” of PICU, and the rest of the patients value 0. “Physicians prediction” thus has scorings 0-4 with increasing value indicating increasing probability for violent or threatening incidents.

In paper 4 we assumed that the use of segregation for inclusion 1 patients and not for inclusion 2 patients might be of importance and introduced the two time-periods as a factor named “Effect of segregation”.

Therapeutic and control steps taken, and nurses observation were coded daily on a 23-item checklist. These included among other things all prescribed medication, side effects, staff contact time, formal restrictions, use of newspapers, and visits from relatives (Appendix 5). Specially trained ward nurses filled in the checklists.

4.5.2 Assessments of substance use and medication

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The patients were systematically examined for substance use and medication by physician on duty at admittance, in evaluation with ward psychiatrist the first weekday after admittance and at discharge from PICU. The families and general practitioners of many of the patients were also interviewed about substance use. In inclusion 1 urine samples were analysed on clinical suspicion of substance use. In inclusion 2 all admitted patients had urine- and blood samples taken within a few hours of admission. The urine samples were analysed with liquid chromatography with mass spectrometry. The samples were analysed with regard to amphetamine, amphetamine-similar substances (including methamphetamine), barbiturates, benzodiazepines, buprenorfine, cannabis, ethanol, cocaine, LSD, opiates and phencyclidine. The test can specify each substance and medication found in the test. The level of creatine was assessed as a measure of authenticity of the sample. In cases with

positive urine samples, quantification of the same substances in blood was done.

The reports from the laboratory were available a week after admittance, and the clinicians were not aware of the results from the analysis in the acute treatment period.

4.5 Statistical analyses

All data were analysed using the Statistical Package for the Social Sciences (version 10.0 and 11.0).

In all papers differences between groups of patients were assessed by Students t-test for comparing means on continuous scales and Mann-Whitney U-test for differences on non-parametric scales (two-tailed). Chi-square was used for comparing frequencies. Missing values for single items on the rating scales were substituted by the mean for continuous scales.

In paper 3 we did post hoc regression analyses to assess the influence of differences in sex ratio and the presence of affective or schizophrenic disorder on the differences between the two groups.

In paper 4 Pearson's correlation were used to examine all predictors for the presence of collinearity among predictors. Hierarchical multiple linear regression was performed to determine the factors that best predicted SOAS incidents after controlling for sex, age and diagnoses. A 3-step, hierarchical, multiple regression analysis was carried out.

Before study 1 power assumptions was performed. The number of subjects in each group was estimated with regard to the possibility to discover clinically important differences in GAF score > 10. We estimated standard deviation = 10, significance level = 0.05 and power = 0.95 indicating a number of subjects per group = 27.

4.6 Study approval

All patients in the study were acutely admitted and in need of closed ward. Their mental condition excluded informed consent and it was not attempted obtained. With this exception, the study was conducted in accordance with the declaration of Helsinki (World Medical Association 2000). The study, including the lack of informed consent, was approved by "The Regional Medical Research Ethics Committee, Central Norway."

5.0 Results

5.1 Paper 1

Effects of different interior decorations in the seclusion area of a psychiatric acute ward.

Arne E. Vaaler, Gunnar Morken and Olav M. Linaker.

Nordic Journal of Psychiatry 2005; 59: 19-24.

Objectives: To compare development in symptoms, behaviours, treatment and patient satisfaction of a traditional interior and an interior furnished like an ordinary home in a seclusion area.

Methods: A naturalistic sample of 56 consecutive patients admitted to an acute ward were allocated to two different seclusion areas, one with a traditional interior and one decorated as an ordinary home. Symptoms of psychopathology, therapeutic steps taken, violent episodes, length of patient stay and patient satisfaction were recorded.

Results: There were no differences in score changes on The Positive and Negative Syndrome Scale for schizophrenia, The Brøset Violence Checklist, or Global Assessment of Function split version scale between the two patient groups. Therapeutic steps taken, number of violent episodes, and length of patient stay was also similar. Female patients preferred an ordinary home interior.

Conclusion: Interior and furnishing like an ordinary home in the seclusion areas created an environment with comparable treatment outcomes to the traditional dismal interior and had positive effects on many patients' well being, at least among the women. The traditional beliefs that a sparsely decorated interior is a method to reduce symptoms of psychopathology and dangerous behaviours were not supported by our data.

5.2 Paper 2

Effects of a Psychiatric Intensive Care Unit in an acute psychiatric department.

Vaaler A E, Morken G, Fløvig JC, Iversen VC, Linaker OM

Nordic Journal of Psychiatry 2006; 60: 144-149.

Objective: Psychiatric acute units use different levels of segregation to satisfy needs for containment and decrease in sensory input for behaviourally disturbed patients. Controlled studies evaluating the effects of the procedure are lacking. The aim of the present study was to compare effects in acutely admitted patients with the use of segregation in a Psychiatric Intensive Care Unit and not in a psychiatric acute department.

Method: In a naturalistic study one group of consecutively referred patients had access only to the Psychiatric Intensive Care Unit, the other group to the whole acute unit. Data were obtained for 56 and 62 patients using several scales.

Results: There were significant differences in reduction of behaviour associated with imminent, threatening incidents (Broset Violence Checklist), and actual number of such incidents (Staff Observation Aggression Scale-Revised) in favour of the group that was segregated in a Psychiatric Intensive Care Unit.

Conclusion: The principles of patient segregation in Psychiatric Intensive Care Units have favourable effects on behaviours associated with and the actual numbers of violent and threatening incidents.

5.3 Paper 3

Substance abuse and recovery in a Psychiatric Intensive Care Unit.

Arne E. Vaaler, Gunnar Morken, John Chr. Fløvig, Valentina C. Iversen, Olav M. Linaker,

General Hospital Psychiatry 2006; 28: 65-70.

Objectives: To compare development in symptoms, behaviours, function and treatment between patients with or without a substance use diagnose in a Psychiatric Intensive Care Unit.

Methods: A total of 118 admitted patients were assessed at admittance, day 3 and at discharge from the Psychiatric Intensive Care Unit. Symptoms of psychopathology, therapeutic steps taken, violent episodes, and length of patient stay were recorded.

Results: Thirty-six of the men (53.7%) and seven of the women (13.7%) had a substance abuse disorder. Substance use patients had less psychiatric symptoms at admittance and showed faster symptom reduction, more favourable and faster improvement of function, and a shorter length of stay. Except for symptom reduction and shorter length of stay, these differences were largely due to differences in sex and diagnoses in the two groups.

Conclusion: In a naturalistic group of patients in a Psychiatric Intensive Care Unit substance use is associated with favourable outcomes compared to patients not using substances.

5.4 Paper 4

Short-term prediction of threatening and violent behaviour in a Psychiatric Intensive Care Unit.

Arne E. Vaaler, Valentina C. Iversen, Gunnar Morken, John Chr. Fløvig, Olav M. Linaker.

Submitted.

Objectives: The aims of the present study were to investigate possible predictive factors for threats and violent incidents the first three days in a PICU population based on evaluations done at admittance.

Methods: In 2000 and 2001 a total of 118 consecutive patients were assessed at admittance to a PICU. Actuarial data from present admission, global clinical evaluations by physician and clinical nurses first day, and environmental factors were related to the outcome measure Staff Observation Aggression Scale-Revised (SOAS-R). Hierarchical multiple linear regression analyses were performed to determine the factors that best predicted SOAS-R incidents.

Results: The final hierarchical regression analysis gave an $R = .59$, $F(2, 106) = 5.17$, $p < .001$. The global clinical evaluations and an observer scale scoring behaviours that predict short-term violence in psychiatric inpatients (The Broset Violence Checklist) were effective and more suitable than actuarial data in predicting short-term aggression. Environmental factors like segregation of patients in the PICU were important.

Conclusion: In a naturalistic group of patients in a PICU prediction of aggressive and threatening incidents should be based on clinical global judgement, and instruments designed to predict short-term aggression in psychiatric inpatients.

6.0 Discussion

6.1 Methodological strengths

The studies are strengthened by the prospective design. In all studies we look at a naturalistic patient population from a defined catchment area. PANSS, GAF-S, BVC and SOAS-R are robust and validated psychometric instruments. The routine screening for substance abuse has been comprehensive. Therapeutic and control steps taken have been controlled for through detailed, daily assessments.

The study changed as little as possible of the daily routines of the department. The admissions, flow of patients, treatment and staff resources were unaltered. The same nurses and the staff treated patients from all the study and control groups thus making environmental differences between the groups limited.

6.2 Methodological weaknesses

6.2.1 Use of mechanical and chemical restraints

The study PICU uses physical, mechanical and chemical restraints to a limited degree as needed. Both in inclusion 1 and 2 two patients were mechanically restrained for short times. Totally three patients were chemically restrained during the inclusions (Zuclopenthixole acetate). The uses of restraints were evenly distributed between the patient groups. We can not

exclude that the use of restraints have had effects on single parameters like SOAS-R incidents.

6.2.2 Evaluation by physician on duty

All acutely admitted patients were evaluated by the physician on duty. The patients evaluated to be in need of stay in the PICU were included in the study except patients filling criteria for exclusion. The physician on duty have made a global impression of the patients' clinical condition and rated the need and reason for admittance to PICU. The inclusion in the study is thus not based on a validated instrument, but it merely reflects the main outcome of what goes on in the mind of the experienced clinician in the first encounter with the patient and reflects the naturalistic setting for the studies. There were no violent or threatening incidents reported among the patients evaluated to not be in need of the PICU. There were no patients evaluated not to be in need of PICU who later at the same admittance deteriorated needing PICU. Therefore it is reason to believe that the number of patients in need of PICU not included in the study was limited. We can not exclude that some patients' need for PICU were exaggerated by the physician on duty with the consequence of admittance to PICU.

6.2.3 Allocation of patients in inclusion 1

Paper 1 is based on inclusion 1 where the patients were allocated to the refurbished wing or the traditional wing following a predetermined rule. They were admitted to the wing with fewest patients, or with even numbers to the wing which did not receive the previous admittance. True randomization would have meant that every patient had had the same possibility of admittance to either wing regardless of how many patients that already were admitted to the wing. Since either wing only has two rooms, we could easily have had the situation of randomizing patients to a filled up wing while the other wing was vacant. In such a situation we would be obliged to discontinue the patient from the study, and admit the patient to the other ward. This would increase the number of discontinuations and interfere with our interpretations. These considerations made true randomization complicated.

6.2.4 Completion of the patient-rating VAS-scale

The patient-rating VAS-scale in paper 1 was completed by 55 % of the patients. One of the reasons for the low figures was that the scale was administered immediately following the patients' discharge from the PICU, and many still suffered a substantial symptom pressure. We thus must evaluate the patient preferences with caution. This reflects some of the problems with self-rating scales in the PICU populations. The patients' ability for self rating is limited due to their psychiatric conditions and affected cognitive functions (Linaker & Moe 2005).

6.2.5 Lack of randomisation

In paper 2 the use of a naturalistic design without the use of randomisation compromises the interpretation of the study. A proper randomisation would have meant that every patient should have been randomised to the two different conditions which then, necessarily, had to be arranged in two different wards. Patients in acute psychiatric units are influenced by a complexity of environmental, social and psychological factors. A design with randomisation would have led to exposure to two different environments including staff. We considered the importance of these factors so substantial that it would have been difficult to interpret the results. In paper 2 data collection was conducted during the same time periods in two consecutive years thus taking into account seasonal variation of human mood, behaviour and psychopathology (Morken 2001). All admitted patients were evaluated for inclusion and only one patient was excluded. In the two groups levels of symptoms, function, behaviour; the numbers of therapeutic steps taken and nurses' observations; and diagnoses were not different. We believe that these factors strengthen our interpretation of the main result.

6.2.6 The detection rate of substance use.

Paper 3 rely on investigation on substance abuse. Many studies have found a low detection rate of substance use in psychiatric treatment (Hansen et al 2000). We have used a prospective design where all patients are systematically examined for substance use both in inclusion 1 and 2. In

inclusion 1 urine samples were analysed on clinical suspicion of substance use. In inclusion 2 all admitted patients had urine- and blood samples taken within a few hours of admission. There is a possibility for undetected substance use patients in inclusion 1. Since the fraction of substance use patients did not differ between the two inclusions, we believe that this number is very limited.

6.2.7 Lack of availability and validation of instruments.

Paper 4 uses the item “Physicians prediction” which is an index composed of the physician on duty’s global impression of the patients need and reason for admittance to PICU. This is not a validated instrument, but reflects the main outcome of the clinician’s impression from the evaluation at admittance. The nurse-rated item “intensity of testing out and pushing limits” has similar shortcomings. The SOAS-R incidents are few, but comparable to other studies. The mean severity score of the incidents is moderate.

The availability of specific rating scales for PICU populations is limited. This is the reason for our use of PANSS scales with time-criterion 24 hours, and some self-made instruments like “physicians prediction” and “therapeutic and control steps taken, and nurses observation”. There is a need for new psychometric instruments tailored for the PICUs and emergency services populations. A problem in many e.g. PANSS items, is the need for presence of expressed, positive symptoms to give single items correct value (Hansen & Strand 2000). In PICUs patient often are initially reluctant to talk about their

thoughts or symptoms like paranoid ideas or depressive delusions in major affective episodes. In such situations the rater must assess the degree of symptoms as expressed by the patient. Such scorings may be too low. The psychotic anxiety often lifts quickly with proper acute treatment. The patients may then be more prone to express their delusions to staff. Comparisons or differences between multiple ratings in such situations can incorrectly indicate that the patients are deteriorating the first days.

Patients in PICUs seldom primarily deteriorate the first days in PICUs. One exception might be conditions caused by progressive, organic diseases. Both in inclusion 1 and 2 we had a number of patients with increasing symptoms measured with PANSS or S-GAF from admittance to day 3. This is probably an artefact as mentioned. Clinicians also suggest that patients may sense the inadequacy of their impulses and control them to some degree in society, but may release the control attempts when hospitalized. Some caution is therefore warranted in the evaluation of the results of PANSS and S-GAF-S regarding symptom amelioration.

6.2.8 Power assumptions.

Before study 1 power calculations were performed. The number of subjects in each group was estimated with regard to the possibility to discover clinically important differences in GAF score (> 10). We estimated standard deviation = 10, significance level = 0.05 and power = 0.95 indicating a number of subjects

per group < 20. We used “one-sided” statistics due to the observation that patients seldom deteriorated during the first few days in PICUs. The results eventually showed that “two-sided” statistics was necessary due to the research artefact mentioned in 6.2.7. We then ended with the n=27. Our inclusion 1 was then terminated with the lowest n = 25, and we thus ended up with a somewhat lower power in paper 1.

6.2.9 Treatment factors not allowed for.

The therapeutic and control steps taken, and nurses observation were coded daily on a 23-item checklist by the nurses on duty. This is not a psychometric instrument but merely a list of some of the factors associated with treatment in a PICU. There are multiple factors associated to treatment. Some of them are seemingly impossible to correct for. One example is the degree of lightning. The refurbished wing has multiple built-in spotlights while the traditional wing has a single lamp in the ceiling. The refurbished wing is directed south while the traditional wing is directed north. The patients in the refurbished wing therefore potentially had better light conditions.

6.2.10 Low level physical and interactional measures.

In PICUs nurses and staff uses a variety of low level physical and interactional measures in order to manage behavioural disturbances. These measures are not likely to be recorded or discussed neither in clinical practice nor research (Ryan & Bowers 2005). Examples are “non-touch guidance” like firm verbal instructions, “show of force” where two or more persons encircle the patient, “contact lead” where the patient are held by the arm and guided towards

intended locations etc. These measures were not recorded in the present studies. We can therefore not exclude that single patients or patient groups have been exposes to these measures in a higher degree than others, though the personnel were the same.

6.2.11 Other effects

Controlling all factors including the Hawthorne effect (benefit from improved routine care within the trial) is impossible. Just carrying out a project in this manner inspires staff to react differently and develop different coping-strategies. We also have reason to believe that the extensive use of routine rating scale measurements have affected treatment outcome and end-point measures in the study. This may have altered the impression of baseline scores (control group scores), but would less influence specific differences between study groups as they were all subjected to the same procedures.

In inclusion 1 we had a total of 5 incidents of threatening and violent behaviour compared to the mean number of 43.4 incidents in the ward during the previous 5 years in a comparable period of the year. The registration of incidents was carried out carefully, and the reason for the low figures is not under-reporting. BVC measures were high in a substantial number of patients, and violent episodes should have been expected (Almvik & Woods 1999). We believe that the systematic and repeated questioning using rating scales disclosed important aspects of symptoms and made the staff able to take these into account in therapy.

6.3 General discussion

The majority of inpatient programs for severely symptomatic psychiatric patients appear to find it impossible to operate without some form of segregation or physical or mechanical restraint (Fisher 1994). Not all professionals consider seclusion or restraints desirable or efficacious. There are ethical objections considering seclusion to be violating the patient's basic rights of freedom and dignity (Council of Europe 2005, Pilette 1978). The message in new guidelines regulating coercive measures in psychiatric practice is the need to be cautious when applying seclusion or restraints (Appelbaum 1999, Dyer 2003, Sailas & Wahlbeck 2005).

In a recent study from the US the authors summarize that experienced clinicians most commonly manage acutely violent patients with restraints and injections. The most frequently used medication turned out to be a combination of neuroleptics (haloperidol) and a benzodiazepine (lorazepam). These treatments were given irrespectively of diagnosis. The authors conclude that these practices involve risks of excessive coercion, overmedication, side effects and exacerbation of underlying medical conditions (Binder & McNiel 1999).

Secluded patients themselves have expressed desires for more staff contact during seclusion, elimination of coercion and stigmatising conditions, and unlocked and more comfortable seclusion rooms (Hammil 1987). Other authors have addressed the need for innovative approaches for PICU-patients such as "extra care areas" away from the main clinical areas, more non-confrontational nursing treatments that allow expression of anger and confusion, and the need for a personal space within a safe, secure and

stimulus controlled setting (Crowhurst & Bowers 2002, Jeffery & Goldney 1982). Norwegian PICUs with an interior decoration as described in paper 1, represent an alternative fulfilling many of the patients' and professionals' desires. The studies described in papers 1, 2 and 4 indicate that such PICUs are effective.

6.4 Discussion paper 1

Paper 1 highlights the effects of different interior decorations and different levels of visual stimuli in the PICU. Despite a detailed recording of patient functioning, behaviours, symptoms, and therapeutic steps taken by the staff, we failed to find negative effects of changing the traditional hypostimulating interior to a more pleasant and home like environment.

Segregation of patients in hypostimulating environments is supposed to work through controlling and reducing external stimuli, and thereby reducing positive- and general psychiatric symptoms and length of patient stay. We found a non-significant tendency towards increased symptom amelioration in the patient group admitted to the hypostimulating interior measured with PANSS total and subscales but not with S-GAF and BVC. The use of S-GAF and PANSS has shortcomings in the PICU-setting. Considering this together with the slightly reduced power in our study, we still can not totally exclude that a hypostimulating interior ameliorates psychiatric symptoms slightly faster than a stimulating interior. However, our main findings with lack of substantial effects on symptoms, functioning and behaviour by ward redesign, corresponds well with the findings of Whitehead et al (1984). It is sometimes argued that providing a more humane clinical setting will hamper staff efforts

to discharge patients because of resistance to leave the ward. Our findings indicate that creating a pleasant environment does not generally increase length of patient stay.

6.4.1 Patient satisfaction

Patient satisfaction is one of the most important measures of the quality of the psychiatric services (Holocomb et al 1998, Røssberg 2005, Shipley et al 2000). Paper 1 describes the patients' self-rated treatment satisfaction scale (Appendix 3). Due to methodological limitations the interpretation of the results must be done with caution, still it is interesting that the groups of patients admitted to the two interior conditions evaluated the ward similar on items measuring general social- and psychological climate. This indicates that patients were treated equally by staff regardless of condition. The differences were statistically significant only on two specific items measuring their reaction to the interior and how it affected them. The women accounted for most of this difference.

The CPT calls for living conditions for psychiatric patients with particular attention to the decoration of both patients' rooms and recreation areas, in order to give patients visual stimulation (Council of Europe 1998, Niveau 2004). Patients' rooms should be appropriately decorated and furnished (Council of Europe 2000, Kingdon et al 2004). Secluded patients themselves have expressed desires for elimination of stigmatising conditions and more

comfortable seclusion rooms (Hammil 1987). The redecorated wing in the PICU represents an approach fulfilling some of these desires.

6.5 Discussion paper 2

6.5.1 Effects of segregation

Paper 2 highlights the effects of the segregation procedure in the PICU. Our main findings were that use of the PICU as a separation area reduces behaviours associated with imminent violence as well as actual violent or threatening incidents. These findings were underscored by the fact that the non-segregated group in inclusion 2 initially had non-significantly lower scorings on BVC and PANSS. Fewer violent incidents and discontinuations could be expected, not more. The fact that the non-segregated group improved less in behaviour is strengthened by the discontinuation of 9 patients with difficult behaviour from this group. These patients had deteriorating function and behaviour, and there is reason to believe that continuing their stay in non-segregated conditions would have continued this and thus strengthened our findings.

6.5.2 Reasons for coercion

Paper 2 gives support to the observations that coercion often is used to control agitation or disorientation (Heilbrun et al 1995, Kaltiala-Heino et al 2003). The actual numbers of discontinuations in the groups were 0 (inclusion

1) and 9 (inclusion 2). The indications for discontinuation and segregation in the non-segregated group were aberrant non-violent behaviour. These are behaviours associated with increased risk of violent behaviour. This finding is similar to studies investigating reasons for seclusion. Violence is not always followed by seclusion, and non-violent behaviour is the most frequent antecedent to seclusion (Brown & Took 1992).

6.5.3 Effects of ward space and architecture

Studies on the associations between crowding and aggression are contradictory (Hardie 1999, Lanza et al 1994, Kumar & Ng 2001, Ng et al 2001, Owen et al 1998, Palmstierna et al 1991). Effects of ward space and architecture are sparsely studied with similar contradictory results (Nijman & Rector 1999, Palmstierna et al 1991, Palmstierna & Wistedt 1995). The findings in paper 2 indicate that the important factor in reducing aggressive incidents in PICU populations is the need to separate single patients or patient groups in the ward. The wards must therefore have possibilities for segregation. The importance of physical space in terms of square meters may be less important.

It thus appears that subjective crowding, when a patient perceive an environment as crowded, may be more likely to precipitate violence than objective crowding (Kumar & Ng 2001). Subjective but not objective crowding has been associated with adverse mental health outcomes (Fuller et al 1996). An important determinant for the feeling of subjective crowding is “the body

buffer zone", defined as the area that demarcates what is perceived as inner versus outer self (Horowitz et al 1964). "The body buffer zone" is a subjective sense that shapes our perception of crowding. It influences our perception of what our space is and when we feel that it is intruded by others (Kumar & Ng 2001). Anxiety occurs when other persons enters "the body buffer zone". Violent prisoners require a larger buffer zone than non-violent prisoners, and violent prisoners often misinterpret others as rushing towards them (Hildret et al 1971, Kinzel 1970). This may be important in the precipitation of violence in psychiatric patients with reduced impulse control (Kumar & Ng 2001, Nijman & Rector 1999).

However, in inclusion 2 the non-segregated patient group was exposed to more factors than crowding possibly associated with violence (Hodgkinson 1985, Morken et al 1999). Examples are more patients, staff and students around indicating increased auditive and visual stimuli, and emotional demands in relationships with staff, other patients and visitors.

6.6 Discussion paper 3

6.6.1 Substance use and outcome of treatment.

Paper 3 highlights some effects of substance use in the PICU population. The main findings were that patients with a substance use diagnosis had a faster symptom reduction, a more favourable and faster improvement of function and a shorter length of stay in PICU compared to patients without a substance use diagnosis. The conclusions drawn from former studies indicating that substance use among psychiatric inpatients are associated with a variety of

adverse consequences (Drake et al 1993, McKeown & Liebling 1995) were not supported by the present data. On the contrary, our data indicate that substance use preceding admittance in PICUs are associated with favourable treatment outcomes in the present admission compared to patients admitted without substance use.

6.6.2 Substance use and hostility.

The findings in previous studies indicating that substance use is associated with hostility and assaultiveness (Drake et al 1993, Yesavage & Sarcone 1983) also gained no support from our data. These differences between studies concerning hostility and assaultiveness are probably due to different populations. Drake et al mostly refer to outpatient populations. Our findings are similar to Dhossche's (1999). His data was drawn from an emergency services patient population in a locked, short-term (up to 72 hours) holding area for extended evaluations. The main findings from these studies are that aggression is not a common acute manifestation of recent substance use in psychiatric emergency settings.

6.6.3 Substance use and symptoms at admittance.

The results from previous research indicate that substance use patients present more severe symptomatology at admittance compared to patients not using substances (Hansen et al 2000, Negrete et al 1986). In the present study from a PICU population both total PANSS scores and PANSS positive subscale including delusions, conceptual disorganisation and suspiciousness

were lower among substance use patients than the other patients at baseline. Even if these differences turned out to be dependent upon sex and diagnoses, our data do not indicate that substance use populations in PICU settings present more severe symptomatology.

6.6.4 Substance use and length of stay.

That substance use predicts shorter length of inpatient stay has been found in some studies (Herr et al 1991, Huntley et al 1998) but not in all (Chang et al 1991). Paper 3 summarises that compared to the control group the patients in the substance use group had a length of stay in our PICU at only 40%. The trends in these findings are underscored by the findings in "therapeutic steps taken and nurses' observations." The substance use group had a non-significantly increased frequency of need to stay in PICU due to behavioural reasons at admittance. Even though the patients in this group displayed significantly less testing out behaviour and significantly more behaviour associated with ability to and interest in social activities the first three days. This trend remained after correction for sex and diagnoses. These factors were obviously important in the joint staff decision to discharge patients from PICU. The rapid improvement was not associated with increased support from family and friends since we found more visits and telephones to patients in the control group not using substances.

Shorter lengths of stay and improved outcome in substance use groups compared to groups of non-users in acute and PICU populations have been explained by premature discharges of substance use patients (Greenfield et al 1995). Our study does not support this. We believe that shorter lengths of

stay in acute settings is partially due to a higher proportion of patients with psychoactive substance induced disorders in the acute settings compared to other inpatient or outpatient settings. However, Ries et al had similar results from a study in acute settings in a sample of patients with schizophrenia and substance use compared to schizophrenia without substance use (Ries et al 2000). We believe that these findings are due to induction or amplification of symptoms by substance use leading to acute admission in the study group. Such symptoms may normalise rapidly after removal of abused substances, which would account for their shorter stays and improved outcomes.

6.6.5 Additional interventions for substance use.

The empirical evidence from other inpatient and outpatient samples strongly supports the adverse effects of substance abuse on the course of severe mental illnesses. Long-time consequences are symptom exacerbation, increased hospitalisation, medication non-compliance, disruptive behaviour and decreased social functioning (RachBeisel et al 1999). Recent research has shown that psychiatric patients with substance use and a psychiatric disorder benefit more from an integrated treatment compared to treatment in psychiatric or substance use treatment facilities alone (Drake et al 1998, Swanson et al 1999). Randomised controlled clinical trials evaluating effects of integrated treatments in PICU populations are lacking. However, there is reason to believe that patients in PICU populations also would benefit from integrated treatments. Substance use groups in PICUs have short lengths of stay. In our study mean length of stay was 2.86 days. Additional interventions

during stay for this patient group have to be of short duration. Of special interest is therefore the study of Swanson et al (1999) indicating that the addition of a brief intervention (1 hour and 15 minute) based on motivational interviewing (Miller & Rollnick 1991) to an already intensive inpatient program led to better treatment adherence among dually diagnosed inpatients. However, the substance use groups in PICUs are heterogeneous with probable differences between countries and cities and rural areas (Lehman et al 1994, Phillips & Johnson 2003). The study by Lehman et al (1994) indicated that as much as 50 % of the substance use population in the acute ward did not have lifetime history of an independent mental disorder, but instead had psychiatric symptoms brought on by their substance use. These patients have different needs than patients with independent mental disorders like schizophrenia and major affective disorders and co-morbid substance use. Innovative solutions and development of integrated and tailored treatments for substance use are thus an aim for PICUs and acute wards (Phillips & Johnson 2003).

6.7 Discussion paper 4.

6.7.1 Prediction of violent or threatening incidents in PICUs.

Paper 4 highlights prediction of possible violent or threatening incidents the first three days in a PICU population. Our results are in accordance with previous studies from acute wards. Generally the predictive value from actuarial data is limited. The global clinical evaluation “Physicians prediction”

from physician on duty, nurses' global evaluation of "intensity of testing out and pushing limits", and the observer-rated scale scoring behaviours predicting imminent violence in psychiatric inpatients (BVC), were more suitable for predicting short-term violent and threatening incidents in the PICU setting.

Based on simple VAS-like scales McNiel et al (1988) and Apperson et al (1993) found that both attending psychiatrists and nurse clinicians were able to predict short-term violence in a reasonable degree in acute wards. In the present study the physician on duty and nurse clinicians have done independent evaluations at different times in a PICU-population. The methods and results from these studies have similarities. Therefore it is reason to believe that experienced staff members in acute settings are able to globally predict short-term violence in their patient populations.

6.7.2 Violent or threatening incidents and psychopathology.

We found no association between SOAS-R ratings and psychopathology measured by PANSS total, PANSS subscales, and GAF-S. This finding is similar to Swett & Mills (1997). Steinert et al. found that scorings on the seven-item PANSS-positive scale correlated significantly with the number of threatening or aggressive incidents in a sample of acutely admitted in-patients (Steinert et al 2000). Findings from studies using BPRS (Overall & Gorham 1962) or PANSS are contradictory. Using the full scale PANSS is time

consuming but thorough, and this systematic questioning discloses important aspects of symptoms and make the staff able to take these into account in therapy. This may lower the number of violent or threatening incidents, and make conclusions from different studies difficult (paper 1).

6.7.3 Effects of segregation.

As expected from paper 2 a predictor for violent episodes was the item “Effect of segregation”. This item is a construct derived from the main difference between inclusion 1 and 2 which was the use of the PICU as a separation area or not (paper 2). We thus get similar results with the different statistical procedures used in paper 2 and 4.

6.7.4 BVC

The observer rated instrument BVC has previously been demonstrated to have satisfactory properties in forensic and acute settings (Abderhalden et al 2004; Almvik et al 2000). In a PICU setting Bjørkedahl et al demonstrated that BVC to a high degree can predict severe violence within the next 24 hours (Bjørkedahl et al 2006). Paper 4 describes that the predictive properties for BVC in the PICU-setting also is satisfactory for the first three days after a single rating at admittance. BVC is short, practical and easy to administer in routine care. Systematic uses of standardized instruments like BVC give staff

opportunities to take preventive measures in limited numbers of high-risk patients.

6.7.5 Admission status

Admission status did not predict SOAS incidents in the present study. This is contrary to findings from for instance Nijman et al who found a history of involuntary admission to be a predictor of aggressive behaviour (2002). This is probable partly due to different criteria for involuntary admissions. Some countries (e.g. Dutch law (Nijman et al 2002)) allow forced hospitalization only when a patient's behaviour constitutes a direct and clear danger to the patient or others. Norwegian law extends this concept and also allows involuntary admissions in other cases of severe mental illness.

6.7.6 Preventive measures on aggressive incidents.

Several studies with different interventions have been conducted to assess the effects of preventive measures on aggressive incidents (Nijman et al 1997). Conclusions are difficult to draw due to shortcomings in the research designs like lack of control conditions, possible under-reporting of aggressive incidents and staffs' awareness of their wards being objects of research. There are also indications that systematic monitoring of aggressive incidents with for instance SOAS-R increases the staffs' awareness of risk factors eventually leading to a decrease in numbers of incidents. Nijman et al (1997) compared the effects of several possible aggressive incidents-reducing

interventions in a closed psychiatric admissions ward with two similar control wards. The main results were a significant reduction of aggressive incidents in all the three wards. The reduction in the intervention ward and control wards were 62% and 43%, a difference that turned out to be non-significant. The results from paper 4 indicate that global experience in staff and structured instruments identify single patients where preventive measures should be considered. These measures should include physical separation of these patients from the other patients.

7.0 Conclusions

General findings.

Patients who have experienced segregation settings like seclusion have desires for alternative treatment conditions. These desires are to a large extent met by Norwegian PICUs.

The studies described in papers 1, 2, and 4 indicate that such PICUs are effective.

Additional general findings.

Even though it was to a limited degree, the study PICU had to use chemical and mechanical restraints in the inclusion periods. There is a need for further studies in PICU populations that addresses the efficacy of different non-coercive interventions to different types of PICU patients.

Main findings paper 1.

Interior and furnishing like an ordinary home in the PICU create an environment with comparable treatment outcomes to the traditional dismal interior and has positive effects on many patients' well being.

Additional findings paper 1.

The traditional beliefs that a sparsely decorated interior is a method to reduce symptoms of psychopathology and dangerous behaviours are not correct at least regarding PICU populations.

Main findings paper 2.

The principles of patient segregation in PICUs have favourable effects on behaviours associated with and the actual numbers of violent and threatening incidents.

Additional findings paper 2.

In the architecture and design of PICUs it is important to take into consideration the possibilities for segregation of patients.

Main findings paper 3.

In a naturalistic group of patients in PICUs substance use is associated with favourable outcomes compared to patients not using substances.

Additional findings paper 3.

Threatening and violent incidents are not common acute manifestations of recent substance use in PICU populations.

Substance use predicts shorter length of inpatient stay in PICU populations.

Main findings paper 4.

In PICUs prediction of aggressive and threatening incidents should be based on clinical global judgement, and instruments designed to predict short-term aggression in psychiatric inpatients.

Additional findings paper 4.

The predictive properties for BVC in the PICU-setting are satisfactory for the first three days after a single rating at admittance.

The predictive value from actuarial data drawn from past medical and social history, behaviours and psychopathology is limited.

8.0 References:

Abderhalden C, Needham I, Miserez B, Almvik R, Dassen T, Haug H-J, Fischer JE. Predicting inpatient violence in acute psychiatric wards using the Brøset-Violence-Checklist: a mulitisenter prospective cohort study. Journal of Psychiatric & Mental Health Nursing 2004; 11: 422-430.

Allen MH, Currier GW. Use of restraints and pharmacotherapy in academic psychiatric emergency services. General Hospital Psychiatry 2004; 26: 42-49.

Almvik R, Woods P. Predicting inpatient violence using the Broset Violence Checklist (BVC). International Journal of Psychiatric Nursing Research 1999; 4: 489-497.

Almvik R, Woods P, Rasmussen K. The Brøset Violence Checklist: sensitivity, specificity, and interrater reliability. Journal of Interpersonal Violence 2000; 15: 1284-1296.

American Psychiatric Association. Global Assessment of Functioning (GAF) scale. In: Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington DC: APA, 1994.

Angold A. Seclusion. British Journal of Psychiatry 1989; 154: 437-444.

Appelbaum PS. Seclusion and restraint: Congress reacts to reports of abuse. Psychiatric Services 1999; 50: 881-882, 885.

Apperson LJ, Mulvey EP, Lidz CW. Short-term clinical prediction of assaultive behavior: Artifacts of research methods. American Journal of Psychiatry 1993; 150; 1374-1379.

Beer MD, Paton C, Pereira S. Hot beds of general psychiatry: a national survey of psychiatric intensive care units. Psychiatric Bulletin 1997; 21: 142-144.

Beer MD, Pereira SM, Paton C. Psychiatric Intensive Care-development and definition. In: Beer, MD, Pereira SM and Paton C, editors. Psychiatric Intensive Care. Greenwich Medical Media Limited, Alden Press, 2001.

Betemps EJ, Somoza E, Buncher CR. Hospital characteristics, diagnoses, and staff reasons associated with use of seclusion or restraint. Hospital and Community Psychiatry 1993; 44: 367-371.

Binder RL, McNiel DE. Emergency psychiatry: Contemporary practice in managing acutely violent patients in 20 psychiatric emergency rooms. Psychiatric Services 1999; 50: 1553-1554.

Bjørkdahl A, Olsson D, Palmstierna T. Nurses' short-term prediction of violence in acute psychiatric intensive care. Acta Psychiatrica Scandinavica 2006; 113: 224-229.

Breslow RE, Erickson BJ, Cavanaugh KC. The psychiatric emergency service: Where we've been and where we're going. Psychiatric Quarterly 2000; 71: 101-121.

Brown JC, Took SK. On the seclusion of psychiatric patients. Social Science and Medicine 1992; 35: 711-721.

Busch-Iversen H, Roksvaag R, Gaustad HP, Linaker OM. Pasienten gikk umotivert til angrep. Sykepleien Journalen, 1994; nr. 9: 18-19.

Chang G, Brenner L, Bryant K. Variables predicting inpatient length of stay in a CMHC. Hospital and Community Psychiatry 1991; 42: 853-855.

Christenfeld R, Wagner J, Pastva G, et al. How physical settings affect chronic mental patients. Psychiatric Quarterly 1989; 60: 253-264.

Conolly J. Treatment of insane without mechanical restraints. London: Dawsons of Pall Mall, 1964.

Corey LJ, Wallace MA, Harris SH, et al. Psychiatric ward. A before and after

look at how refurbishing affects staff and patient perceptions of the psychosocial treatment environment. Journal of Psychosocial Nursing and Mental Health Services 1986; 24: 10-16.

Cornwall PL, Hassanyeh F, Horn C. High-dose antipsychotic medication – improving clinical practice in a psychiatric special (intensive) care unit. Psychiatric Bulletin 1996; 20: 676-680.

Council of Europe. Eighth general report on the CPT's activities covering the period 1 January to 31 December 1997. http://www.cpt.coe.int/en/annual/rep-08.htm CPT/Inf (98) 12 [EN], 1998.

Council of Europe. White paper regarding a draft recommendation on legal protection of persons suffering from mental disorder. Especially those placed as involuntary patients. Strasbourg: Council of Europe 2000.

Crenshaw WB, Caine KA, Francis PS. An updated national survey on seclusion and restraint. Psychiatric Services 1997; 48: 395-397.

Crowhurst N, Bowers L. Philosophy, care and treatment on the psychiatric intensive care unit: themes, trends and future practice. Journal of Psychiatric and Mental Health Nursing 2002; 9: 689-695.

Davis C, Glick ID, Rosow I. The architectural design of a psychotherapeutic milieu. Hospital and Community Psychiatry 1979; 30: 453-460.

Dix R. Psychiatric intensive care and low security units past, present and future – introducing the Journal of Psychiatric Intensive Care. Journal of Psychiatric Intensive Care 2005; 1: 1-2.

Dix R, Williams K. Psychiatric intensive care units, a design for living. Psychiatric Bulletin 1996; 20: 527-529.

Dhossche DM. Aggression and recent substance abuse: Absence of association in psychiatric emergency room patients. Comprehensive Psychiatry 1999; 40: 343-346.

Drake RE, Alterman AI, Rosenberg SR. Detection of substance use disorders in severely mentally ill patients. Community Mental Health Journal 1993; 29: 175-192.

Drake RE, Mercer-MacFadden C, Mueser KT, McHugo GJ, Bond GR. Review of integrated mental health and substance abuse treatment for patients with dual disorders. Schizophrenia Bulletin 1998; 24: 589-608.

Dyer C. Unjustified seclusion of psychiatric patients is breach of human rights. British Medical Journal 2003; 327: 183.

Fisher WA. Restraint and seclusion: A review of the literature. American Journal of Psychiatry 1994; 151: 1584-1591.

Freedman F, Greenblatt M. Sensory deprivation and personality. American Journal of Psychiatry 1960; 116: 878-882.

Friis S. Factors influencing the ward atmosphere. Acta Psychiatrica Scandinavica 1986; 73: 600-606.

Friis S, Melle I, Opjordsmoen S, Retterstøl N. Global assessment scale and health-sickness rating scale: problems in comparing the global functioning scores across investigations. Psychotherapy Research 1993; 3: 105-114.

Fuller TD, Edwards JN, Vorakitphokatorn S, Sermsri S. Chronic stress and psychological well being: evidence from Thailand on household crowding. Social Science and Medicine 1996; 42: 265-280.

Greenblatt M, York RH, Brown EL, et al. From custodial to therapeutic patient care in mental hospitals. New York: Arno Press 1980.

Greenfield SF, Weiss RD, Tohen M. Substance abuse and the chronically mentally ill: a description of dual diagnosis treatment services in a psychiatric hospital. Community Mental Health Journal 1995; 31: 265-277.

Gutheil TG. Observations on the theoretical bases for seclusion of the psychiatric inpatient. American Journal of Psychiatry 1978; 135: 325-328.

Gutheil TG, Daly M. Clinical considerations in seclusion room design. Hospital and Community Psychiatry 1980; 31: 268-270.

Hammil K. Seclusion: Inside looking out. Nursing times 1987; 83: 38-39.

Hansen SS, Munk-Jørgensen P, Guldbæk B, et al. Psychoactive substance use diagnoses among psychiatric in-patients. Acta Psychiatrica Scandinavica 2000; 102: 432-438.

Hansen B, Strand G. Interrating av PANSS på pasienter innlagt i norsk akuttavdeling. ”Internal report”, Psychiatric Institute, Faculty of Medicine, NTNU, 2000.

Hardie TJ. Crowding and violent behaviour: the influence of patient density on violent and self harming behaviour at a medium secure unit. Medicine, Science, and the Law 1999; 39: 161-166.

Heilbrun K, Golloway GG, Shoukry VE, Gustafson D. Physical control of patients on an inpatient setting: forensic vs. civil populations. Psychiatric Quarterly 1995; 66: 133-145.

Hem E, Steen O, Opjordsmoen S. Thrombosis associated with physical restraints. Acta Psychiatrica Scandinavica 2001; 103: 73-75.

Herr BE, Abraham HD, Anderson W. Length of stay in a general hospital psychiatric unit. General Hospital Psychiatry 1991; 13: 68-70.

Hildret AM, Derogatis LR, McCusker K. Body buffer zone and violence: a reassessment and confirmation. American Journal of Psychiatry 1971; 127: 1641-1645.

Hilliam J, Evans C. Neuroleptic drug use in psychiatric intensive therapy units: problems with complying with the consensus statement. Psychiatric Bulletin 1996; 20: 82-84.

Hodgkinson P. The use of seclusion. Medicine, Science, and the Law. 1985; 25: 215-222.

Holocomb WR, Parker JC, Leong GB, Thiele J, Higdon J. Customer satisfaction and self-reported treatment outcomes among psychiatric inpatients. Psychiatric Services 1998; 49: 929-934.

Horowitz MJ, Duff D, Stratton L. The body buffer zone: an exploration of personal space. Archives of General Psychiatry 1964; 11: 651-656.

Huntley DA, Cho DW, Christman J, Csernansky JG. Predicting length of

stay in an acute psychiatric hospital. Psychiatric Services 1998; 49: 1049-1053.

James DV, Fineberg NA, Shah AK, et al. An increase in violence on an acute psychiatric ward: a study of associated factors. British Journal of Psychiatry 1990; 156; 846-852.

Jeffery A, Goldney R. An innovation: the psychiatric intensive care unit. Australian Nurses Journal 1982; 12: 42-43.

Kaltiala-Heino R, Tuohimaki C, Korkeila J, Lehtinen V. Reasons for using seclusion and restraint in psychiatric inpatient care. International Journal of Law and Psychiatry 2003; 26: 139-149.

Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophrenia Bulletin 1987; 13: 261-276.

Kingdon D, Jones R, Lønnqvist J. Protecting the human rights of people with mental disorder: new recommendations emerging from the Council of Europe. British Journal of Psychiatry 2004; 185: 277-279.

Kinzel AF. Body buffer zone in violent prisoners. American Journal of Psychiatry 1970; 127: 59-64.

Kumar S, Ng B. Crowding and violence on psychiatric wards: Explanatory models. Canadian Journal of Psychiatry 2001; 46: 433-437.

Lanza ML, Kayne HL, Hicks C, Milner J. Environmental characteristics related to patient assault. Issues in Mental Health Nursing 1994; 15: 319-335.

Lehman AF, Myers CP, Corty E, Thompson JW. Prevalence and patterns of “Dual diagnosis” among psychiatric in-patients. Comprehensive Psychiatry 1994; 35: 106-112.

Linaker OM, Busch-Iversen H. Predictors of imminent violence in psychiatric inpatients. Acta Psychiatrica Scandinavica 1995; 92: 250-254.

Linaker OM, Moe A. The COOP/WONCHA charts in an acute psychiatric ward. Validity and reliability of patients’ self-report of functioning. Nordic Journal of Psychiatry 2005; 59: 121-126.

Mason T. Seclusion theory reviewed-a benevolent or malevolent intervention? Medicine, Science, and the Law 1993; 33: 95-102.

McKeown M, Liebling H. Staff perception of illicit drug use within a special hospital. Journal of Psychiatric and Mental Health Nursing 1995; 2: 343-350.

McNiel DE, Binder RL, Greenfield TK. Predictors of violence in civilly committed acute psychiatric patients. American Journal of Psychiatry

1988; 145: 965-970.

Melle I. Patients with schizophrenia from one catchment area. A seven-year follow-up study. Thesis University of Oslo, 2000.

Melle I, Friis S, Hauff E, Island TK, Lorentzen S, Vaglum P. The importance of ward atmosphere in inpatient treatment of schizophrenia on short-term units. Psychiatric Services 1996; 47: 721-726.

Middelboe T, Schødt T, Byrsting K, et al. Ward atmosphere in acute psychiatric in-patient care: patients' perceptions, ideals and satisfaction. Acta Psychiatrica Scandinavica 2001; 103: 212-219.

Miller WR, Rollnick S. Motivational Interviewing: Preparing people to change addictive behaviours. New York: The Guilford Press, 1991.

Mohr WK, Petti TA, Mohr BD. Adverse effects associated with physical restraint. Canadian Journal of Psychiatry 2003; 48: 330-337.

Morken G. Seasonal variation of human mood and behaviour. Thesis Norwegian University of Science and Technology, 2001.

Morken G, Langsrud K, Linaker OM. Weekly and daily variations in patient-staff incidents in psychiatric acute wards. Nordic Journal of Psychiatry 1999; 53: 293-295.

Negrete JC, Knapp WP, Douglas DE, Smith WB. Cannabis affects the severity of schizophrenic symptoms: results of a clinical survey. Psychological Medicine 1986; 16: 515-520.

Newman O. Summary and recommendations. In: Defensible space. People and design in the violent city. London: Architectural press;1973.

Ng B, Kumar S, Ranclaud M, Robinson E. Ward crowding and incidents of violence on an acute psychiatric unit. Psychiatric Services 2001; 52: 521-525.

Nijman HLI, Merckelbach HI, Allertz WF, à Campo JM. Prevention of aggressive incidents on a closed psychiatric ward. Psychiatric Services 1997; 48; 695-698.

Nijman H, Merckelbach H, Evers C, Palmstierna T, Campo J à. Prediction of aggression on a locked psychiatric admission ward. Acta Psychiatrica Scandinavica 2002; 105; 390-395.

Nijman H, Muris P, Merckelbach HLGJ, et al. The Staff Observation Aggression Scale – Revised (SOAS – R). Aggressive Behavior 1999; 25: 197-209.

Nijman H, Palmstierna T, Almvik R, Stolker JJ. Fifteen years of research with the Staff Observation Aggression Scale: a review. Acta Psychiatrica

Scandinavica 2005; 111; 12-21.

Nijman HLI, Rector G. Crowding and aggression on inpatient psychiatric wards. Psychiatric Services 1999; 50; 830-831.

Niveau G. Preventing human rights abuses in psychiatric establishments: the work of the CPT. European Psychiatry 2004; 19: 146-154.

Noble P, Rodger S. Violence in psychiatric in-patients. British Journal of Psychiatry 1989; 155: 384-390.

O´Brien L, Cole R. Mental health nursing practice in acute psychiatric close-observation areas. International Journal of Mental Health Nursing 2004; 13: 89-99.

Overall J, Gorham DR. The brief psychiatric rating scale. Psychological Reports 1962; 10; 799-812.

Owen C, Tarantello C, Jones M, Tennant C. Violence and aggression in psychiatric units. Psychiatric Services 1998; 49: 1452-1457.

Palmstierna T, Huitfeldt B, Wistedt B. The relationship of crowding and aggressive behavior on a psychiatric intensive care unit. Hospital and Community Psychiatry 1991; 42; 1237-1240.

Palmstierna T, Wistedt B. Changes in the pattern of aggressive behaviour among inpatients with changed ward organization. Acta Psychiatrica Scandinavica 1995; 91; 32-25.

Palmstierna T, Wistedt B. Staff Observation Aggression Scale, SOAS: presentation and evaluation. Acta Psychiatrica Scandinavica 1987; 76: 657-663.

PANSS Training Videotape, Janssen Research Foundation, Richard C. Meibach, CNS Department, 1989.

Paterson B, Bradley P, Stark C, Saddler D, Leadbetter D, Allen D. Deaths associated with restraint use in health and social care in the UK. The results of a preliminary survey. Journal of Psychiatric and Mental Health Nursing 2003; 10: 3-15.

Peralta V, Cuesta MJ. Psychometric properties of the positive and negative syndrome scale (PANSS) in schizophrenia. Psychiatry Research 1994; 53: 31-40.

Phillips P, Johnson S. Drug and alcohol misuse among in-patients with psychotic illnesses in three inner-London psychiatric units. Psychiatric Bulletin 2003; 27: 217-220.

Pilette PC. The tyranny of seclusion: a brief essay. Journal of Psychosocial Nursing and Mental Health Services 1978; 16: 19-21.

Postel J. Genèse de la psychiatrie: les premiers écrits de Philippe Pinel. Paris, Le sycomore, 1981, 233-248.

RachBeisel J, Scott J, Dixon L. Co-occurring severe mental illness and substance use disorders: A review of recent research. Psychiatric Services 1999; 50: 1427-1434.

Rachlin S. On the need of a closed ward on an open hospital: the psychiatric intensive care unit. Hospital and Community Psychiatry 1973; 24: 829-833.

Raja M, Azzoni A. Second generation antipsychotics in the emergency care setting. A prospective naturalistic study. General Hospital Psychiatry 2000; 22: 107-114.

Regier DA, Farmer ME, Rae DS, et al. Co-morbidity of mental disorders with alcohol and other drugs of abuse: results from the epidemiological catchment area (ECA) study. Journal of the American Medical Association 1990; 264: 2511-2518.

Ridgely MS, Johnson S. Drug and alcohol services. In: Textbook of Community Psychiatry (eds. Szmucler G, Thornicroft G), pp 347-367. Oxford: Oxford University Press, 2001.

Ries RK, Russo J, Wingerson D, et al. Shorter hospital stays and more rapid improvement among patients with schizophrenia and substance disorders. Psychiatric Services 2000; 51: 210-215.

Ryan CJ, Bowers L. Coercive manoeuvres in a psychiatric intensive care unit. Journal of Psychiatric and Mental Health Nursing 2005; 12: 695-702.

Røssberg JI. Evaluations of inpatient units with emphasis on the ward atmosphere scale. Dissertation for the Degree of Ph.D. Faculty of Medicine, University of Oslo, 2005.

Sailas E, Fenton M. Seclusion and restraint for people with serious mental illnesses (Cochrane Review). In: The Cochrane Library, Issue 1, 2001. Oxford: Update Software.

Sailas EA, Wahlbeck K. Restraint and seclusion in psychiatric inpatient wards. Current Opinion in Psychiatry 2005; 18: 555-559.

Sandford T. Drug use is increasing. Nursing Standard 1995; 9: 16.

Sanguineti VR, Brooks M. Factors related to emergency commitment of

psychiatric substance-abusing patients. Hospital and Community Psychiatry 1992; 43: 237-241.

Shipley K, Hilborn B, Hansell A, Tyrer J, Tyrer P. Patient satisfaction: a valid index of quality of care in psychiatric service. Acta Psychiatrica Scandinavica 2000; 101; 330-333.

Soderberg P, Tungstrom S, Armelius BA. Reliability of global assessment of functioning ratings made by clinical psychiatric staff. Psychiatric Services 2005; 56: 434-438.

Steinert T. Prediction of inpatient violence. Acta Psychiatrica Scandinavica Supplemetum 2002; 106; 133-141.

Steinert T, Wølfle M, Gebhardt R-P. Measurement of violence during in-patient treatment and association with psychopathology. Acta Psychiatrica Scandinavica 2000; 102; 107-112.

Swanson AJ, Pantalon MV, Cohen KR. Motivational interviewing and treatment adherence among psychiatric and dually diagnosed patients. The Journal of Nervous and Mental Disease 1999; 187: 630-635.

Swett C, Mills T. Use of the NOSIE to predict assaults among acute psychiatric patients. Psychiatric Services 1997; 48; 1177-1180.

Tooke SK, Brown JS. Perceptions of seclusion: comparing patient and staff reactions. Journal of Psychosocial Nursing and Mental Health Services 1992; 30: 23-26.

Walker Z, Seifert R. Violent incidents in a Psychiatric Intensive Care Unit. British Journal of Psychiatry 1994; 164; 826-828.

Weiner DB. Philippe Pinel's "Memoir on Madness" of December 11, 1794: A fundamental text of modern psychiatry. American Journal of Psychiatry 1992; 149: 725-732.

Whitehead CC, Polsky RH, Crookhank C, et al. Objective and subjective evaluation of psychiatric ward redesign. American Journal of Psychiatry 1984; 141: 639-644.

Wilson MR, Soth N, Robak R. Managing disturbed behaviour by architectural changes; making space fit the program. Milieu Therapy 1983; 2: 15-24.

Wing JK. From institutional to community care. Psychiatric Quarterly 1981; 53: 139-152.

World Health Organisation. The ICD-10 classification of mental and behavioural disorders. Diagnostic criteria for research. Geneva: WHO, 1993.

World Medical Association. Declaration of Helsinki: ethical principles for medical research involving human subjects. Journal of the American Medical Association 2000; 284: 3043-3045.

Wright S. Control and restraint techniques in the management of violence in inpatient psychiatry: A critical review. Medicine, Science, and the Law 2003; 43: 31-38.

Wynn R. Medicate, restrain or seclude? Strategies for dealing with violent and threatening behaviour in a Norwegian university psychiatric hospital. Scandinavian Journal of Caring Sciences 2002; 16: 287-291.

Yamauchi K, Ono Y, Baba K, Ikegami N. The actual process of rating the global assessment of functioning scale. Comprehensive Psychiatry 2001; 42: 403-409.

Yesavage JA, Zarcone V. History of drug abuse and dangerous behavior in inpatient schizophrenics. Journal of Clinical Psychiatry 1983; 44: 259-261.

Zealberg JJ, Brady KT. Substance abuse and emergency psychiatry. Emergency Psychiatry 1999; 22: 803-816.

Zigmond. Special care wards: are they special? Psychiatric Bulletin 1995; 19: 310-312.

Figure I

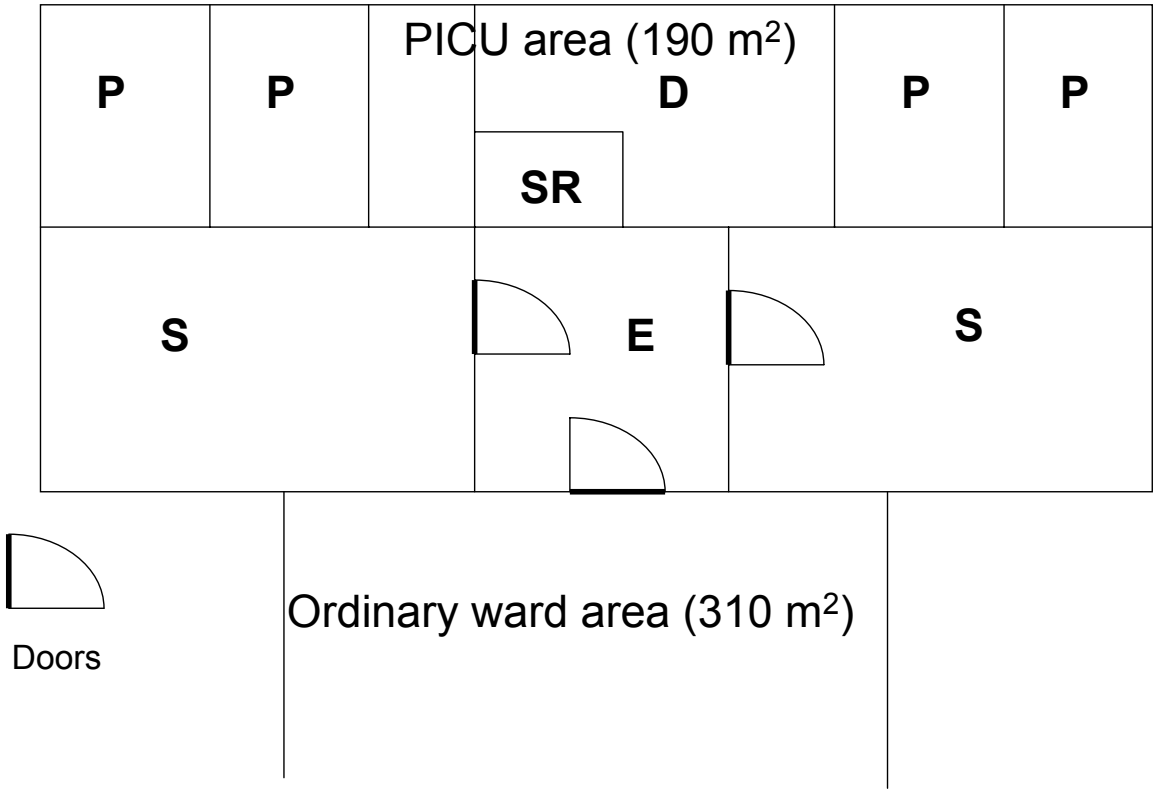

Fig 1.

A sketch of the acute ward with the Psychiatric Intensive Care Unit at Østmarka Psychiatric Department, St. Olavs Hospital.

S=Sitting room; D=Dining room; SR=Staff room; P=Patient room; E=Entrance.

Appendix I

Appendix 1. Physician's evaluation of the need and reason for segregation (Norwegian version).

SKJERMINGSBEHOV.

Registrering for prosjekt "Effekt av interiør i skjermet avsnitt i psykiatrisk avdeling" STPS avd. Østmarka post 1.

Dette skjema fylles ut av vakthavende assistentlege og sykepleiere i fellesskap i forbindelse med innleggelsen på skjermet enhet.

Pasient: …….. Nummer i studien:…….
Dato: …… Utfylt av : ……

A : Er det sannsynlig at denne pasient har behov for å være på skjermet avsnitt ?

Nei	
Lite sannsynlig	
Sannsynlig	
Absolutt behov	

B : Årsak til skjermingsbehov.*

Pasientens eget ønske	
Behov for tett observasjon av diagnostisk eller medisinsk grunn	
Behov for redusert mengde stimuli	
Behov for å kunne kontrollere pasientens adferd	

* Kryss av for alle aktuelle årsaker.

Appendix II

Appendix 2: Physician's evalution of the need and reason for segregation (English version).

NEED FOR SEGREGATION.

Registration in the project" Effects of the interior decorations in the separation area in Department of Psychiatry, St. Olavs Hospital, acute ward 1".

This instrument is to be filled in by the physician on duty and nurses together in connection with the patient's admittance to the separation area.

Patient: …….. Study ID:…….
Date: …… Filled in by: ……

A : Is it probable that the patient has a need to be admitted to the separation area?

No	
Little probability	
Probable	
Absolute need	

B : Reason for admittance to separation area.*

The patient's own wish	
Need for close observation due to diagnostic or medical reasons	
Need to reduce the amount of stimuli	
Need to control the patient's behaviour	

* Indicate all reasons.

Appendix III

Appendix 3: The patient rated treatment satisfaction scale (Norwegian version).

HVORDAN HAR OPPHOLDET PÅ SKJERMET VÆRT ?

Vi ønsker å vite hvordan du har hatt det under oppholdet på skjermet. Det gjør vi for å kunne bedre forholdene for pasientene som er der. Vi vil ha oppriktige svar. Ikke vær redd for å gi ris eller ros.

. Ditt skjema vil ha et ID-nummer som er kun til statistisk bruk. Det vil ikke bli koblet med ditt navn. Dine svar vil bli behandlet anonymt.

Etter hvert spørsmål har vi satt opp en linje. Med å sette et kryss på denne linje viser du hvor misfornøyd eller fornøyd du er med det spørsmålet gjelder. (se eksempler under).

Gi gjerne kommentarer under.

Eksempler:
A : Hvis du i spørsmål 1 er svært misfornøyd kan du krysse slik :
Svært *Svært*
Misfornøyd -x---------- fornøyd

B : Hvis du i spørsmål 1 er middels fornøyd kan du krysse slik:
Svært *Svært*
misfornøyd ----------x---------- fornøyd

C : Hvis du i spørsmål 1 er svært fornøyd kan du krysse slik:
Svært *Svært*
misfornøyd ----------x- fornøyd

Hvis noe er uklart, må du ikke nøle med å spørre personalet om mer informasjon eller hjelp.

ID-nummer i studien : …….. Dato for utfylling: ……..

---

1 : Hvor fornøyd er du med den hjelp du fikk for dine problemer ?

Svært Svært
misfornøyd ---------- fornøyd

(Eventuelle kommentarer) :
……
……

2 : Hvordan var støtten du fikk av personalet under oppholdet ?

Svært dårlig ---------- Svært god

(Eventuelle kommentarer) :
……
……

3 : Hvor respektfullt synes du generelt at du ble behandlet ?

Svært lite respektfullt ---------- Svært respektfullt

(Eventuelle kommentarer) :
……
……

4 : Hvor fornøyd er du med maten du fikk på skjermet ?

Svært dårlig ---------- Svært godt

(Eventuelle kommentarer) :
……
……

5 : Hvordan likte du interiøret på den delen av skjermet (sidegangen og rommet) hvor du oppholdt deg ?

Svært dårlig ---------- Svært godt

(Eventuelle kommentarer) :
……
……

6 : Hvordan virket interiøret på deg i den situasjon du var i ?

Svært dårlig ---------- Svært godt

(Eventuelle kommentarer) :
……
……

7 : Hvor fornøyd er du med informasjonen du fikk om virkninger og bivirkninger av medisinene du brukte under oppholdet på skjermet ?

Svært misfornøyd ---------- Svært fornøyd

(Eventuelle kommentarer) :
……
……

8 : Hvor trygg kjente du deg under oppholdet på skjermet ?

Svært utrygg ---------- Svært trygg

(Eventuelle kommentarer) :
……
……

Vær vennlig å sjekk at du har besvart alle åtte spørsmål med ett kryss på linjen for hvert av dem. Legg skjemaet i vedlagte konvolutt og gi det til sykepleier. Skjemaet blir bearbeidet anonymt av overlege Gunnar Morken.

Mange takk for hjelpen!

Appendix IV

Appendix 4: The patient rated treatment satisfaction scale (English version).

YOUR OPINION ABOUT THE SECLUDED AREA OF THIS HOSPITAL .

In our efforts to improve patients' stay in the secluded area of this hospital, we would like to know how you found your stay there. This is important for us because we want to make conditions better for our future patients.

Your responses will be handled with strict confidentiality and will not in any way be connected to your name. For statistical purposes the questionnaire has an ID-number

We want honest answers. Please, do not hesitate to either criticise or praise us.

After each question you will find a line (see examples below). On this line, please indicate by a cross mark how satisfied or dissatisfied you felt. Also, feel free to add further comments below in the indicated sections.

Examples :
A : If on question 1 you are dissatisfied you may put your cross like this:
Very *Very*
dissatisfied -x---------- satisfied

B: If on question 1 you are neither satisfied nor dissatisfied you may put your cross like this:
Very *Very*
dissatisfied ----------x---------- satisfied

C : If on question 1 you are very satisfied you may put your cross like this:
Very *Very*
dissatisfied ----------x- satisfied

Please feel free to ask the hospital staff for further information or help, if needed.

ID-number in the study: …… Date: ……..

---

1 : How satisfied were you with the help you got for your problems?

Very Very
dissatisfied ---------- satisfied

(Comments if you like):
……
……

2 : How was the support you got from the staff while you were in the secluded area ?

Very poor ---------- Very good

(Comments if you like) :
……
……

3 : How respectfully were you treated in general ?

Very disrespectfully ---------- Very respectfully

(Comments if you like) :
……
……

4 : How pleased were you with the food in the secluded area ?

Very unpleased ---------- Very pleased

(Comments if you like) :
……
…….

5 : How did you find the interior of the side hall and your room ?

Very bad ---------- Very good

(Comments if you like) :
……
……

6 : Did the interior influence you in a positive or negative way?

Very negative ---------- Very positive

(Comments if you like) :
……
……

7 : How satisfying was the information given to you about effects and adverse effects of the medication received while you were in the secluded area ?

Very dissatisfying ---------- Very satisfying

(Comments if you like) :
……
……

8 : How secure did you feel while you were staying in the secluded area ?

Very insecure ---------- Very secure

Please make sure that you have answered all the eight questions with one cross on each line. Put the questionnaire in the envelope and give it to the hospital staff. Chief physician Gunnar Morken will handle the form.

Thank you for your kind co-operation!

Appendix V

Appendix 5: Therapeutic and control steps taken and nurses' observations (Norwegian version).

REGISTRERING AV PASIENTDATA OG TILTAK.

Prosjekt ved STPS avdeling Østmarka post 1.

Navn : Nummer i studien : Registreringsdato :

Punktene 1-23 registreres for de siste 24 timer.
Skjemaet fylles ut av miljøkontakt på ettermiddagsvakt ved tidspunkt for rapportskriving i cardex.

nr	Innhold	Ikke tilstede	Lite	En god del	Mye	Svært mye
1	Hyppighet av grenseutprøving. *					
2	Intensitet av grenseutprøving. *					
3	Behov for å sette grenser. * / **					
4	Mengde bruk av sosialt fellesareal. *					
5	Mengde bruk av TV / radio. *					
6	Mengde bruk av aviser, blader og bøker. *					
7	Mengde besøk eller telefon fra/til familie og venner. *					
8	Hvor mye er pasienten alene på sidegang/eget rom?					
9	Ekstrapyramidale bivirkninger utenom akathisi.					
10	Akathisi.					

* Standard normalt for ikke pasienter.
** Hypotese om årsak: ……

nr	Innhold	Brukt	Ikke brukt
11	Utgang uten følge		
12	Utgang med følge		
13	Fysiske tvangsmidler (reimer)		
14	Dør til sidegang låst		
15	Fastvakt		
16	Formelt vedtak om restriksjon av besøk/telefon.		

	Medikamenter	Brukt	Preparat (navn)	Dose	Ikke brukt
17	Sedativa og hypnotika				
18	Nevroleptika per os				
19	Nevroleptika inj. ekskl.depot				
20	Depotnevroleptika				
21	Antidepressiva				
22	Stemningsstabiliserende (antiepileptika og lithium)				
23	Antihistamin				

Utfylt av :

Appendix VI

Appendix 6: Therapeutic and control steps taken and nurses' observations (English version).

Registration of patients, and therapeutic and control steps taken.

Project at St. Olavs Hospital, Dept. of Psychiatry, acute ward 1.

Name : Study ID : Date of registration :

The items 1-23 are registered for the last 24 hours.
Each item is recorded by the primary nurse in the afternoon at the time of writing daily report in the cardex.

nr	Content	Not present	A little	Some	A lot	Very much
1	Frequency of pushing limits. *					
2	Intensity of pushing limits. *					
3	Need to set limits. * / **					
4	Amount of used social and mutual areas. *					
5	Use of TV / radio. *					
6	Use of papers, magazines and books. *					
7	Visits / telephones from fam. / friends. *					
8	Time alone in side-wing or patient room.					
9	Extrapyramidale side effects other than akathisia.					
10	Akathisia.					

* Standard normal for persons not being patients.
** Hypothesis about reason.
……

nr	Content	Used	Not used
11	Going out without company		
12	Going out with company		
13	Restraints (belts)		
14	Door to side-wing locked		
15	Continuous guard by nurses		
16	Formal restrictions in visits / telephone.		

	Medication	Used	Type (name)	Doses	Not used
17	Sedatives and hypnotics				
18	Oral neuroleptics				
19	Inj. neuroleptics other than depots				
20	Depot neuroleptics				
21	Antidepressants				
22	Mood stabilisers (antiepileptic or lithium)				
23	Antihistamines				

Recorded by :

Paper I

Paper I and II are not included in the file due to copyright.

Paper III

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General Hospital Psychiatry

Emergency Psychiatry in the General Hospital

The emergency room is the interface between community and health care institution. Whether through outreach or in-hospital service, the psychiatrist in the general hospital must have specialized skill and knowledge to attend the increased numbers of mentally ill, substance abusers, homeless individuals, and those with greater acuity and comorbidity than previously known. This Special Section will address those overlapping aspects of psychiatric, medicine, neurology, psychopharmacology, and psychology of essential interest to the psychiatrist who provides emergency consultation and treatment to the general hospital population.

Substance abuse and recovery in a Psychiatric Intensive Care Unit

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Abstract

Objectives: The purpose of this study is to compare the development in symptoms, behaviors, function and treatment between patients with or without a substance use (SU) diagnose in a Psychiatric Intensive Care Unit (PICU).
Methods: A total of 118 admitted patients were assessed at admittance, day 3 and discharge from the PICU. Symptoms of psychopathology, therapeutic steps taken, violent episodes and length of patient stay were recorded.
Results: More males than females received an SU diagnosis. Substance use patients had less psychiatric symptoms at admittance and showed a faster symptom reduction, more favorable and faster improvement of function and a shorter length of stay. Except for symptom reduction and shorter length of stay, these differences were largely due to differences in sex and diagnoses in the two groups.
Conclusion: In a naturalistic group of patients in a PICU, SU is associated with favorable outcomes compared to patients not using substances.

Keywords: Psychiatry; Emergency services; Intensive care; Substance abuse

1. Introduction

The frequency of psychoactive substance use (SU) among psychiatric in-patients ranges from 25% to 75% [1–3]. Substance use is associated with a variety of adverse consequences [4]. There are indications that SU patients present more severe symptomatology compared to patients without substance use (WSU) [5]. Substance use patients have been found to have higher rates of admissions [6], greater use of in-patient services [7] and extensive social dysfunction [8] compared to WSU patients. Substance use has also been found to interfere with the expression and resolution of symptoms of psychiatric disorders [9] to dramatically induce or influence acute behavioral changes and to have significant effects on treatment outcome and costs [10,11].

There are indications that SU psychiatric in-patients have different recoveries and needs compared to not active users [2]. Bowers et al. [12] used fixed doses of neuroleptics comparing effects in psychotic in-patients who were users or not users of substances. They found a relative neuroleptic refractoriness in the SU group. Sanguineti and Samuel [13] compared acutely admitted in-patients screened positive for SU with patients screened negative for SU. At day 5, patients with schizophrenia and SU had lower BPRS scores than those with schizophrenia and negative screens [14]. These findings were taken as an indication of greater recovery from psychotic relapse in the SU group. In the same study, a reverse trend was found among patients with affective disorders. Goldberg et al. [15] found SU among bipolar 1 in-patients to be associated with slower symptom reduction and lower likelihood of remission from a manic episode.

Ries et al. [16] used the Psychiatric Symptom Assessment Form [17] demonstrating that SU in-patients with acute schizophrenia admitted to integrated treatment for psychiatric and addiction disorders had a greater treatment

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response than WSU patients receiving similar services, but without the drug and alcohol focus. In this integrated treatment program, the SU patients had 30% shorter length of stay compared to WSU patients [16]. Substance use predicting shorter length of stay has been found in other studies [18–20], but not in all [21].

In Psychiatric Intensive Care Units (PICUs) and emergency services, SU patients constitute a very heterogeneous patient group, spanning from patients with independent mental disorders complicated by SU to patients with psychoactive SU-induced disorders only [3]. The typical contemporary PICU patient presents in severe crisis often complicated by SU, behavioral dyscontrol and multiple axis 1 diagnoses [11].

Studies of SU conducted in PICU populations are sparse. In these acute settings, time is an essential factor. Patient observations and admissions are brief. Recent research have shown that SU patients in other in-patient settings benefit from integrated treatments, as opposed to treatments available in ordinary psychiatric or SU treatment facilities [16,22]. Investigations of clinical differences between SU and WSU patients in PICUs are important in order to develop integrated treatments for the SU populations in acute units.

The aims of the present study were to investigate differences in symptoms, behaviors, therapeutic steps taken and length of stay in a PICU between patients with SU or WSU diagnosis.

2. Methods

2.1. Population

The acute Østmarka Psychiatric Department, St. Olavs University Hospital, Trondheim, Norway, has a catchment area of 140 000 inhabitants both from the city of Trondheim (50%) and the surrounding rural areas (50%). About 600 adult patients suffering from acute psychiatric conditions are admitted each year. All persons in the catchment area in need of PICU are admitted to this department. Only patients with acute psychiatric conditions are admitted to the department. Patients with intoxication alone are admitted to separate acute, short-term substance abuse treatment facilities.

2.2. Setting

The acute department consists of two ordinary closed ward areas, each with a PICU area with four beds. The patients were admitted to the acute ward with most free capacity. One ward was used for the study, and the patients excluded from the study were admitted to the other ward. The study changed as little as possible of the daily routines of the department.

The physician on duty evaluated all the patients acutely admitted to the ward. The patients evaluated to be in need of PICU were admitted to the PICU area and included in the study, except patients with dementia, mental retardation or autism to a severe degree and patients not speaking Norwegian or English. These patients were excluded at evaluation before entering the PICU area and admitted to the other ward.

2.3. Instruments

Symptoms, general psychopathology, function and behavior were assessed with the Positive And Negative Syndrome Scale (PANSS) for schizophrenia [23], with time criterion the last 24 h, the Global Assessment Scale Split version (GAF-S) and the Broset Violence Checklist (BVC) [24] at admittance (baseline), day 3 and at discharge (end point) from PICU. Global Assessment Scale Split version is based on DSM-4's GAF [25] and is a two-item scale measuring global symptoms (GAF-S-Symptoms) and functioning (GAF-S-Function) separately. Broset Violence Checklist is a six-item observer-rated scale scoring behaviors that predict imminent violence in psychiatric inpatients [26]. Violent or threatening incidents were recorded with Staff Observation Aggression Scale-Revised [27]. Therapeutic and control steps were taken and nurses' observations were coded daily on a 23-item checklist. These therapeutic steps and observations included for instance all prescribed medication, side effects, formal restrictions, staff contact time, use of newspapers and visits from relatives. Specially trained unit nurses did all the ratings. At admittance, the physician on duty evaluated the patients' need for PICU on a scale with scorings 1–4 (4 representing absolute need). The reasons for admittance to PICU were rated on a scale with four categories (patient's own wish, need of close observation, stimuli reduction or control of behavior).

The decision to transfer a patient from PICU to ordinary area was a joint decision in the ward staff after taking into account symptoms, behavior and function. The day the patients were transferred to the ordinary area of the ward were recorded as end point of the study.

The patients were systematically examined for SU at admittance, in evaluation with ward psychiatrist the first weekday after admittance and at discharge from PICU. The families and general practitioners of many of the patients were also questioned about SU. In the first period (November 13, 2000, to March 25, 2001) ($n=56$), urine samples were analyzed on clinical suspicion of SU. In the second period (October 1, 2001, to March 21, 2002) ($n=62$), all admitted patients had urine and blood samples taken within a few hours of admission. The urine samples were analyzed with liquid chromatography with mass spectrometry. In cases with positive urine samples, quantification of the same substances in blood was done.

The reports from the laboratory were available a week after admittance, and the clinicians were not aware of the results from the analysis in the acute treatment period.

Diagnoses according to ICD-10 Diagnostic criteria for research [28] were set by consensus in the department's staff, including at least three specialists in psychiatry of whom at least two personally knew the patient.

These diagnoses were set after the patients had been discharged from the hospital, and the results from all analyses for SU were taken into account. The patients filling criteria for any SU disorder (F10.00–F19.99) were allocated to the SU group regardless of other diagnoses. Patients not filling criteria for any SU disorder constituted the WSU group.

2.4. Study design

The study is a descriptive longitudinal study with control group.

2.5. Statistics

Differences between the SU and the WSU groups were assessed by Student's *t* test and Mann–Whitney *U* test (two-tailed). χ^2 was used to compare frequencies. Missing values for single items on the rating scales were substituted by the mean for the item. We used post hoc regression analyses to assess the influence of differences in sex ratio and the presence of affective or schizophrenic disorder on the differences between the groups.

2.6. Ethics

The study was approved by "The Regional Medical Research Ethics Committee, Central Norway."

3. Results

A total of 43 (SU group) and 75 (WSU group) patients were included. More males (36 of 67) than females (7 of 51) were substance users (χ^2=20.01, *df*=1, $P \leq .0001$). There were no differences in mean age between SU [37.8 (S.D., 14.3)] and WSU [35.6 (S.D., 15.5)]. One patient with senile dementia was excluded. There were a tendency toward differences in the reasons for stay in PICU with more patients in SU group admitted with reason "to control the patients behavior" (χ^2=8.19, *df*=4, *P*=.08). When corrected for sex ratio and diagnostic composition, the difference became significant (*P*=.002). Data for behavior, function and symptoms at admittance are summarized in Table 1. There were significant group differences in PANSS-positive subscales and PANSS total indicating more psychiatric symptoms in the WSU group. There were significant differences in single items concerning delusions, conceptual disorganization and suspiciousness. These differences, however, turned out to be dependent upon sex and diagnoses. The changes in assessments of behavior, function and symptoms from baseline (admittance) to day 3, and length of stay in PICU are summarized in Table 2. There was a significant difference in the changes of the GAF-S-Symptoms ratings with largest increase in the SU group indicating more reduction of symptoms. This remained significant after correction for sex and diagnoses (*P*=.002). Length of stay was significantly shorter in the SU group with means 2.86 and 7.08. After correction for sex and diagnoses, this remained significantly different (*P*=.014). There were 6 (SU) and 13 (WSU) violent or threatening incidents with no significant difference between groups.

Table 1
Assessments of behavior, function and symptoms at baseline of patients with an SU diagnosis and without a substance use diagnosis (WSU)

Characteristic	SU group (*n*=43)		WSU group (*n*=75)		*P*
	Mean	S.D.	Mean	S.D.	
PANSS total[a]	68.6	21.5	77.0	22.2	.02
PANSS positive[b]	15.5	7.6	19.0	8.2	.02
PANSS negative[b]	16.6	8.1	18.6	8.3	ns
PANSS general[c]	36.5	9.0	39.5	10.2	ns
BVC[d]	0.88	1.19	0.78	1.21	ns
GAF-S-Function[e]	33.8	12.1	32.0	12.8	ns
GAF-S-Symptoms[e]	32.1	12.8	31.6	13.0	ns

Mann–Whitney *U* tests.
[a] Scoring range, 30–210.
[b] Scoring range, 7–49.
[c] Scoring range, 16–112.
[d] Scoring range, 0–6.
[e] Scoring range, 1–100.

Table 2
The changes in assessments of behavior, function and symptoms from baseline to day 3 or in end point stays shorter than 3 days among patients with an SU and WSU diagnosis

Characteristic	SU group (*n*=43)		WSU group (*n*=75)		*P*
	Mean	S.D.	Mean	S.D.	
PANSS total	−5.0	11.3	−1.9	18.4	ns
PANSS positive	−1.2	4.7	−1.5	5.8	ns
PANSS negative	−0.8	3.5	0.0	5.2	ns
PANSS general	−2.9	6.8	−0.9	10.1	ns
BVC	−0.40	0.91	−0.32	1.25	ns
GAF-S-Function	4.9	9.7	1.4	8.3	ns
GAF-S-Symptoms	11.0	14.5	2.0	9.3	.002
Length of stay in days	2.86	2.89	7.08	7.70	.011

Length of stay in psychiatric intensive care (Mann–Whitney *U* tests).
Negative values due to lower scorings at day 3.

Table 3
Significant differences in daily assessments on the 23-item checklist "therapeutic and control steps taken and nurses' observations" (first 3 days) between patients with an SU and WSU diagnosis

Characteristic	SU group (*n*=85 days)		WSU group (*n*=174 days)		*P*
	Mean	S.D.	Mean	S.D.	
Frequency of testing out and pushing limits[a]	0.40	0.85	0.63	0.95	.025
Intensity of testing out and pushing limits[a]	0.48	0.80	0.71	1.04	.031
Adequate use of TV/radio[a]	0.96	0.99	0.67	0.85	.022
Adequate use of papers, magazines and books[a]	0.88	0.97	0.64	0.85	.043
Amount of visits and telephones from family and friends[a]	0.78	0.79	1.10	0.92	.007
Antidepressants[b]	0.22	0.42	0.13	0.33	.045
Neuroleptics[b]	0.27	0.45	0.47	0.50	.002

Mann–Whitney *U* tests.
[a] Five category scale: 0=not present, 1=minimal, 2=some, 3=much, 4=very much.
[b] Two category scale: 0=not used, 1=used.

Eight single items in the 23-item checklist of therapeutic steps taken and nurses' observations were significantly different between groups assessed daily the first 3 days. The main differences are summarized in Table 3. Generally, the SU group tended to have a behavior less associated with pushing and testing out limits, a more adequate use of TV, radio and newspapers, and to use less per oral neuroleptics and more antidepressants compared to the WSU group. These effects were, however, largely explained by group differences in sex ratio and diagnoses. The WSU group had more visits and telephones from family and friends.

4. Discussion

We have studied a naturalistic sample of consecutively, acutely admitted in-patients in need of PICU. Patients with an SU diagnosis showed a faster symptom reduction, a more favorable and faster improvement of function and a shorter length of stay in PICU compared to patients without an SU diagnosis. Drake et al. [4] concluded that SU among psychiatric patients are associated with a variety of adverse consequences. Our data indicate that SU in PICU populations are associated with favorable treatment outcomes compared to WSU patients for the present admission.

The present study demonstrates a male dominance among SU patients. Ries et al. [16] found 65% males in a population of acutely admitted schizophrenic in-patients. Sanguineti and Samuel [13] found no gender difference in a population of patients with exacerbation of long-standing disorders.

The results from previous research, mostly derived from outpatient populations, indicate that SU patients present more severe symptomatology compared to WSU patients [2,5,29]. In the present study from a PICU population, both total PANSS scores and PANSS-positive subscale, including delusions, conceptual disorganization and suspiciousness, were lower among SU patients than WSU patients at baseline. Even if these differences turned out to be dependent upon sex and diagnoses, our data do not indicate that SU populations in this setting present more severe symptomatology.

The differences in the number of "therapeutic steps taken and nurses' observations" indicate that the improvement in function of the SU group was greater than in the WSU group. The degree of testing out limits and adequate use of social areas, papers, TV and radio was all in favor of the SU group indicating better function. A similar indication is the lower use of neuroleptics and higher use of antidepressants in the SU group.

The patients in the SU group had greater symptom reduction with more increase in GAF-S-Symptoms measured from admittance to day 3. Sanguineti and Samuel [13] have demonstrated similar findings among patients with schizophrenia but not among patients with affective disorders.

The findings in previous studies indicating that SU is associated with hostility and assaultiveness [4] were not supported by our data. The results from therapeutic steps taken and nurses' observations were significantly in favor of the SU patients indicating behavior less associated with hostility and assaultiveness, and if corrected for sex and diagnoses, no group differences were found, although the tendency remained. The differences between studies concerning hostility and assaultiveness are probably due to different populations. Drake et al. mostly refer to outpatient populations. Our findings are similar to Dhossche's [30]. His data were drawn from an emergency patient population in a locked, short-term (up to 72 h) holding area for extended evaluations. The main findings of the study were that aggression is not a common acute manifestation of recent SU in psychiatric emergency room patients.

Patients in the SU group had a length of stay in PICU at only 40% of the WSU group's. The trends in these findings are underscored by the findings in therapeutic steps taken and nurses' observations. Even though the SU group had a nonsignificantly increased frequency of need to stay in PICU due to behavioral reasons at admittance, the patients in this group displayed significantly less testing out behavior and significantly more behavior associated with ability to and interest in social activities the first 3 days, a trend that remained after correction for sex and diagnoses. These factors were obviously important in the joint staff decision to discharge patients from PICU. The rapid improvement was not associated with increased support from family and friends because we found more visits and telephones to patients in the WSU group.

The significantly different use of neuroleptics and antidepressants between groups could indicate different degrees of depressive symptoms or side-effects influencing function and symptoms. This was not supported by our data. The PANSS general psychopathology item "global depression" was identical in the groups both at admittance and after 3 days. Daily registrations of potential side effects including dystonias and akathisia were similar in the groups.

Differences in the patient populations included in the studies, variations in institutional routines between hospitals and differences in design limit the possibility to generalize results from studies in acute psychiatric departments. In the present study, all consecutively admitted patients from a defined catchment area were included. The use of standardized instruments to assess behavior, function and symptoms at admittance and day 3, together with daily thorough registration of therapeutic and control steps taken and nurses' observations, made it possible to evaluate changes with acceptable control of most important factors affecting treatment.

Many studies have found a low detection rate of SU in psychiatric treatment [2]. In our study, the investigation of SU was extensive. There is a reason to believe that the number of undetected SU patients is limited. In the first period of the data collection, urine and blood samples were not collected from every patient; still, the fraction with SU patients did not differ between the two periods.

The definition of SU group patients in our study were patients with an SU disorder without taking into account whether they had other axis 1 diagnoses or not. The SU group patients are thus composed of patients with both independent mental disorders complicated by SU and patients with psychoactive SU-induced disorders only. Distinctions between these two groups are difficult in a short-term setting. Although we have attempted to correct our main findings for comorbidity of affective disorders and schizophrenia, some caution is warranted in comparing our results with other studies using different diagnostic definitions.

The empirical evidence from other inpatient and outpatient samples strongly supports the adverse effects of substance abuse on the course of severe mental illnesses. Long-time consequences are symptom exacerbation, increased hospitalization, medication noncompliance, disruptive behavior and decreased social functioning [31]. Findings from acute and PICU populations are different with shorter lengths of stay and improved outcomes in SU groups compared to WSU groups. These findings have been explained by premature discharges of SU patients [22]. Our study does not support this. There is a reason to believe that shorter lengths of stay in acute settings is partially due to a higher proportion of patients with psychoactive SU-induced disorders in the acute settings compared to other inpatient or outpatient settings. However, Ries et al. [16] had similar results from a study in acute settings in a sample of patients with schizophrenia and SU compared to schizophrenia and WSU. We believe that these findings are due to induction or amplification of symptoms by SU in the SU group. Such symptoms may normalize rapidly after removal of abused substances, which would account for their shorter stays and improved outcomes.

Recent research has shown that psychiatric patients with SU and a psychiatric disorder benefit more from a specially integrated treatment compared to treatment in psychiatric or SU treatment facilities [22,32,33]. Randomized controlled clinical trials evaluating effects of integrated treatments in PICU populations are lacking. However, there is a reason to believe that patients in PICU populations also would benefit from integrated treatments. A study from two PICUs and nine open acute wards in inner London indicates the frequency of SU in PICUs [34]. Eighty-nine percent of the patients reported to have had used illicit drugs or alcohol on the ward during a previous admission, and 83% had used substances during the current admission. The clinical implication of this is an obvious need of routine screening for nonprescribed psychoactive drugs.

There is also a reason to believe that the staffs in PICUs need increased attention to SU. In a study by Prochaska et al. [35], it was demonstrated that increased attention to SU has consequences for assessments, discharge diagnoses and treatment planning, including referrals to SU treatment.

The SU group in our study had a mean length of stay of 2.86 days. Additional interventions during stay for this patient group have to be of short duration. Of special interest is, therefore, the study of Swanson et al., indicating that the addition of a brief intervention (1 h and 15 min) based on motivational interviewing to an already intensive inpatient program led to a better treatment adherence among dually diagnosed inpatients.

5. Conclusion

In a naturalistic group of patients admitted to PICU, SU is associated with faster improvement, more favorable behavior and shorter length of stay in intensive treatment compared to WSU patients.

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References

[1] Crowley TJ, Chesluk D, Dilts S, Hart R. Drug and alcohol abuse among psychiatric admissions: a multidrug clinical–toxicologic study. Arch Gen Psychiatry 1974;30:13–20.
[2] Hansen SS, Munk-Jørgensen P, Guldbæk B, et al. Psychoactive substance use diagnoses among psychiatric in-patients. Acta Psychiatr Scand 2000;102:432–8.
[3] Lehman AF, Myers CP, Corty E, Thompson JW. Prevalence and patterns of "Dual diagnosis" among psychiatric in-patients. Compr Psychiatry 1994;35:106–12.
[4] Drake RE, Alterman AI, Rosenberg SR. Detection of substance use disorders in severely mentally ill patients. Community Ment Health J 1993;29:175–92.
[5] Carey MP, Carey KB, Meisler AW. Psychiatric symptoms in mentally ill chemical abusers. J Nerv Ment Dis 1991;179:136–8.
[6] Bartels SJ, Teague GB, Drake RE, Bush PW, Noordsy DL. Substance abuse in schizophrenia: service utilisation and costs. J Nerv Ment Dis 1993;181:227–32.
[7] Menezes PR, Johnson S, Thornicroft G, et al. Drug and alcohol problems among individuals with severe mental illnesses in South London. Br J Psychiatry 1996;168:612–9.
[8] Drake RE, Wallach MA. Substance abuse among the chronic mentally ill. Hosp Community Psychiatry 1989;40:1041–6.
[9] Sanguineti VR, Brooks M. Factors related to emergency commitment of psychiatric substance-abusing patients. Hosp Community Psychiatry 1992;43:237–41.
[10] McNiel DE, Binder RL, Greenfield TK. Predictors of violence in civilly committed acute psychiatric patients. Am J Psychiatry 1988;145:945–70.
[11] Zealberg JJ, Brady KT. Substance abuse and emergency psychiatry. Emergency Psychiatry 1999;22:803–16.
[12] Bowers MB, Mazure CM, Nelson CJ, Jatlow PI. Psychotogenic drug use and neuroleptic response. Schizophr Bull 1990;16:81–5.
[13] Sanguineti VR, Samuel SE. Comorbid substance abuse and recovery from acute psychiatric relapse. Hosp Community Psychiatry 1993; 44:1073–6.
[14] Overall JE, Gorham DR. The brief psychiatric rating scale. Psychol Rep 1962;10:799–812.
[15] Goldberg JF, Garno JL, Leon AC, Kocsis JH, Portera L. A history of substance abuse complicates remission from acute mania in bipolar disorder. J Clin Psychiatry 1999;60:733–40.

[16] Ries RK, Russo J, Wingerson D, et al. Shorter hospital stays and more rapid improvement among patients with schizophrenia and substance disorders. Psychiatr Serv 2000;51:210–5.
[17] Roy-Byrne PP, Dagadakis C, Ries R, et al. A psychiatrist-rated battery of measures for assessing the clinical status of psychiatric in-patients. Psychiatr Serv 1995;46:347–52.
[18] Ananth J, Vanderwater S, Kamal M, Brodsky A, Gamal R, Miller M. Missed diagnosis of substance abuse in psychiatric patients. Hosp Community Psychiatry 1989;40:297–9.
[19] Herr BE, Abraham HD, Anderson W. Length of stay in a general hospital psychiatric unit. Gen Hosp Psychiatry 1991;13:68–70.
[20] Huntley DA, Cho DW, Christman J, Csernansky JG. Predicting length of stay in an acute psychiatric hospital. Psychiatr Serv 1998;49: 1049–53.
[21] Chang G, Brenner L, Bryant K. Variables predicting inpatient length of stay in a CMHC. Hosp Community Psychiatry 1991;42:853–5.
[22] Greenfield SF, Weiss RD, Tohen M. Substance abuse and the chronically mentally ill: a description of dual diagnosis treatment services in a psychiatric hospital. Community Ment Health J 1995;31: 265–77.
[23] Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophr Bull 1987; 13:261–76.
[24] Almvik R, Woods P. Predicting inpatient violence using the Broset Violence Checklist (BVC). Int J Psychiatr Nurs Res 1999;4:489–97.
[25] American Psychiatric Association. Global Assessment of Functioning (GAF) scale. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): APA; 1994.
[26] Linaker OM, Busch-Iversen H. Predictors of imminent violence in psychiatric inpatients. Acta Psychiatr Scand 1995;92:250–4.
[27] Palmstierna T, Wistedt B. Staff Observation Aggression Scale. SOAS: presentation and evaluation. Acta Psychiatr Scand 1987;76:657–63.
[28] World Health Organisation. The ICD-10 classification of mental and behavioural disorders. Diagnostic criteria for research. Geneva: WHO; 1993.
[29] Negrete JC, Knapp WP, Douglas DE, Smith WB. Cannabis affects the severity of schizophrenic symptoms: results of a clinical survey. Psychol Med 1986;16:515–20.
[30] Dhossche DM. Aggression and recent substance abuse: absence of association in psychiatric emergency room patients. Compr Psychiatry 1999;40:343–6.
[31] RachBeisel J, Scott J, Dixon L. Co-occurring severe mental illness and substance use disorders: a review of recent research. Psychiatr Serv 1999;50:1427–34.
[32] Swanson AJ, Pantalon MV, Cohen KR. Motivational interviewing and treatment adherence among psychiatric and dually diagnosed patients. J Nerv Ment Dis 1999;187:630–5.
[33] Drake RE, Mercer-MacFadden C, Mueser KT, McHugo GJ, Bond GR. Review of integrated mental health and substance abuse treatment for patients with dual disorders. Schizophr Bull 1998;24:589–608.
[34] Phillips P, Johnson S. Drug and alcohol misuse among in-patients with psychotic illnesses in three inner-London psychiatric units. Psychiatri Bull 2003;27:217–20.
[35] Prochaska JJ, Gill P, Hall SE, Hall SM. Identification and treatment of substance misuse on an inpatient psychiatry unit. Psychiatr Serv 2005;56:347–9.

Paper IV

Short-term prediction of threatening and violent behaviour in a Norwegian Psychiatric Intensive Care Unit.

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Key words: Psychiatry, violence, prediction, Psychiatric Intensive Care, short-term.

Abstract:

Objectives: The aims of the present study were to investigate possible predictive factors for threats and violent incidents the first three days in a PICU population based on evaluations done at admittance.

Methods: In 2000 and 2001 a total of 118 consecutive patients were assessed at admittance to a PICU. Actuarial data from present admission, global clinical evaluations by physician and clinical nurses first day, and environmental factors were related to the outcome measure Staff Observation Aggression Scale-Revised (SOAS-R). Hierarchical multiple linear regression analyses were performed to determine the factors that best predicted SOAS-R incidents.

Results: The final hierarchical regression analysis gave an $R = .59$, $F(2, 106) = 5.17$, $p < .001$. The global clinical evaluations and an observer scale scoring behaviours that predict short-term violence in psychiatric inpatients (The Broset Violence Checklist) were effective and more suitable than actuarial data in predicting short-term aggression. Environmental factors like segregation of patients in the PICU were important.

Conclusion: In a naturalistic group of patients in a PICU prediction of aggressive and threatening incidents should be based on clinical global judgement, and instruments designed to predict short-term aggression in psychiatric inpatients.

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