Psychiatric Intensive Care Units: a literature review

Report from the Conflict and Containment Reduction Research Programme

Len Bowers, City University

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Department of Mental Health and Learning Disability
City University
London E1 2EA
There is no detailed history of the use of psychiatric intensive care in the UK or its antecedents. However, it would appear that at some point during the history of institutional care and the asylums, the ward grading system was introduced as a matter of both efficiency and to provide an incentive system for patient behaviour. More pleasant wards were at the top of this system, and at the bottom was the refractory or disturbed ward, geared to cope with the most difficult patients. In the earlier part of the 20th Century, such wards would have coped with the most difficult patients amongst an Asylum population that was largely long stay. After the introduction of new legislation facilitating voluntary admission, such wards probably also catered for the more disturbed in this new population of patients. With the expansion of more open acute wards thereafter, coupled later with the again more liberal Mental Health Act of 1959, this population on the ‘disturbed ward’ would have also increased. Yet such wards were still sited within large old asylums, and were taking episodically difficult patients from the long stay wards as well as from open acute units. They may even have had a smaller group of patients whose disturbance was more ingrained and continuous, and who could not be coped with elsewhere within the hospital.

In the 1980s such large Asylums began to contract at a significantly greater rate. Not only was community care becoming established, which meant that long stay wards closed. A system of ‘dowries’, or the moving of patients together with the money that funded their care, back to their localities and communities of origin also sped this process. Those localities far from the Asylum also opened new psychiatric units, usually attached to general hospitals. Because they could no longer access intensive care wards in the old Asylum, some of such units opened their own Psychiatric Intensive Care Units (Ford & Whiffin 1991). The opening of new Regional Secure Units over the late 1970s and 1980s also led to a more diversified psychiatric health economy and variant pathways of care for difficult patients depending upon what was available locally and how gateways between different care sectors were operationalised. By this stage PICUs were varyingingly admitting transfers of difficult patients from local acute wards, known problematic patients from the community and/or community hostels, patients brought in by the police as being mentally disturbed in a public place, mental ill patients convicted of minor crimes and admitted by the courts, and some permanently disturbed patients who could not be placed anywhere else. The growing recognition of the latter group who had always existed, led to the creation of specialist secure rehabilitation units, or high dependency units (Reed Committee report).

What is a PICU?

First descriptions of and studies of or in PICUs started to appear in the 1970s in the UK (Mounsey 1979; Weaver, Broome, & Kat 1978), USA (Rachlin 1973) and in the 1980s in Australia (Goldney et al. 1985; Goldney, Spence, & Bowes 1986; Hafner et al. 1989; Jeffery & Goldney 1982) and Canada (Musisi, Wasylkeni, & Rapp 1989). PICUs described in the UK and Australian literature seem to be fairly similar. They are small wards, with higher levels of nursing and other staff, built on an open plan to ease observation, and often (but not always) locked, and sometimes (but not always) with facilities for seclusion. Those in the USA and Canada are less well described or studied, and seem to vary a great deal, as one might expects in countries that have multiple overlapping health care systems. For example, one studied unit places all
patients in isolation, seclusion or restraint for the first 48 hours (Cohen & Khan 1990; Khan et al. 1987), whereas another took physically ill psychiatric patients alongside other disturbed patients and was not always locked (Michalon & Richman 1990).

**Literature search strategy**

This review took as its starting point two previous reviews (Crowhurst & Bowers 2006; O'Brien & Cole 2003), and further references were obtained by a process of snowballing. Additional studies detailing research on a variety of topics that was located in PICUs was obtained from parallel reviews of violence, absconding, coerced IM medication, manual restraint etc. Some of these items contained information about Psychiatric Intensive care, and this was extracted for the review.

**Procedure**

The aims of literature review project was to establish existing evidence for and against the working model and assess commonality and links between different conflict and containment types such as patient profiles, chains of events, patient experiences, circumstances of use, etc.

These aims therefore dictated how each paper was dealt with. A matrix was constructed in Excel with a number of headings ranging from the evidence the article provided for and against the working model; the methodology, sample, definitions and setting used in the article; the patient profiles (age, gender, ethnicity, diagnosis, marital status); the rates of occurrence; times and places or occurrence of the event; the patient’s perceptions of the absconding event; administration and regulation; circumstances of event; antecedents and causes; relationships between types of conflict/containment events; patient motivations; economics and cost and efficacy and outcome.

Therefore, each article was reviewed and analysed with the concept of extracting data/evidence for the relevant sections in the matrix in addition to the quality and rigour of each study (generally in comments section).

A hierarchy of evidence was established by the project manager to rate the weight of each study in relation to the project’s aims. The most weight was given to those studies conducted in the UK, on acute wards and/or PICU and are randomised trials.

In order to rate each study in the remit of the hierarchy of evidence, a rating system was added to columns in Excel.

The rating system included:

<table>
<thead>
<tr>
<th>Rating score (highest first)</th>
<th>Country</th>
<th>Setting (all inpatient)</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UK</td>
<td>Acute wards/PICUs</td>
<td>Randomised trials</td>
</tr>
<tr>
<td></td>
<td>English speaking commonwealth country studies (Australia, Canada and New Zealand*)</td>
<td>Forensic</td>
<td>Trials with controls</td>
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<tr>
<td>2</td>
<td>Other (USA, Denmark, Germany, etc)</td>
<td>Elderly/children/chronic/chronic and acute</td>
<td>Trials without controls (before and after)</td>
</tr>
<tr>
<td>3</td>
<td>General Hospital</td>
<td>Natural experiments</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td>Retrospective/official records</td>
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<td>5</td>
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<td>Observational</td>
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<td>6</td>
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<td>Other (eg. interviews)</td>
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<td>7</td>
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</tbody>
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* It was decided that Republic of Ireland should be included under English speaking commonwealth countries as it was part of the Commonwealth until 1949 and XXX

The studies were rated according to each of the above criteria in Excel and a total rating was given to each study with 1 being most weighted and 14 having the least weight.

**Overview of study methodologies**

The vast majority of studies are retrospective, descriptive and dependent upon official records. Only a few of these have used a comparison group of non-PICU patients so that differences can be identified. There are only three studies which have attempted to measure outcome, one of which was a before and after study in the form of a natural experiment, and the other two non-randomised, not blind, and with a very short-term outcome (48 hrs).

**Evidence for the working model**

In the view of PICU patients (O'Brien & Cole 2004a), activities keep them occupied, give them outlets, and reduce agitation. They liked structure and routine, and said lack of interaction from nurses, lack of being heard, not being treated with respect, all lead to agitation, aggression and seclusion. These statements support the idea that an effective structure that is ethically based leads to lower levels of conflict.

Some oblique evidence that fear leads to more use of the PICU is provided by a study in which nurses at six hospitals were interviewed on the criteria for transfer to psychiatric intensive care (Bowers et al. 2003). Acute admission ward nurses had lower thresholds of tolerance for aggression and were more likely than PICU nurses to consider verbal abuse by a patient as a good reason for transfer. This is somewhat similar to two case studies (O'Connor 1998), where it is asserted that PICU nurses
seek to persuade medical staff to prescribe higher levels of medication when they are frightened of patients or unconsciously angry towards them.

A satisfaction survey of PICU patients showed they were most dissatisfied about the locked door, lending some support to the idea that high levels of containment generate conflict (Wykes & Carroll 1993).

In the views of interviewed nurses (O'Brien & Cole 2004b), the individual patient experience of being understood and heard decreases conflict and containment. Control based zero tolerance approaches stimulate conflict. This is in full accord with the model descriptions of positive appreciation, psychological understanding, and ineffective structure.

**Evidence against the working model**

In that very strict containment on a PICU was found to reduce symptomatology, the two US studies with controls suggest that rather than exacerbating conflict, containment might act to reduce it (Cohen & Khan 1990; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987).

In a descriptive study (Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986) it is reported that following the sudden death of a patient significant reductions in the use of medication occurred, suggesting that anxiety can lead to reductions in containment as well as increases. However anxiety for patient safety might be considered distinct from anxiety about what patients might do to the staff, and might have different outcomes.

Some nurses in an interview study argued that too much activity on a PICU ran counter to the provision of a low stimulus environment (O'Brien & Cole 2004b), suggesting that structure can be too much.

**Points the working model has missed**

The evidence provided in several papers suggests that patient factors have a very significant role to play in determining conflict and containment. A study of patient violence on the PICU showed that most violence came from a small number of repetitively aggressive patients, implying that patient factors rather than staff factors play a major role (Eaton & Gharma 2000). Other studies find links between extreme psychotic symptomatology and incidents (Cooper et al. 1983), also suggesting that patient factors are important.

A few papers argue that behavioural contagion occurs (O'Brien & Cole 2004b; Rachlin 1973) particularly among the group of disturbed patients on the PICU. One study provides evidence for this (Cooper, Brown, McLean, & King 1983) and goes on to suggest that seclusion reduces this effect. In a descriptive time series analysis of incidents on a PICU this phenomenon was observed and reported (Weaver, Broome, & Kat 1978). The mechanism for behavioural contagion may be one patient copying
another as this study suggests, or may be that incidents induce fear in other patients, leading to overreactions and further conflict.

One study finds a link between the day before and day of the ward round and incidents (Cooper, Brown, McLean, & King 1983), advancing a stress hypothesis similar to our own.

Studies linking crowding to conflict (Palmstierna, Huittfelt, & Wistedt 1991) may be misinterpreting their data. It may not be crowding but new admissions that are generating incidents.

Absconding was reduced by better physical security (higher walls, more secure locks), suggesting that physical security is also important in conflict reduction (Gentle 1996).

A study on length of stay on the PICU (Michalon & Richman 1990) suggests that patient flows in a unit are going to influence where incidents take place. Blockages into or out of a PICU are going to relocate incidents that would otherwise have occurred elsewhere (or perhaps not at all).

### Interesting, but not evidenced speculations

One study (Jeffery & Goldney 1982) suggests that patients become dependent on the secure atmosphere generating a sense of comfort and low anxiety, while staff develop feelings of omnipotence and superiority to other wards.

Another paper (Lehane & Rees 1995) Describes a minimal intervention model, a leave alone, individuals not immediately forced to conform to a nurse-defined standard of behaviour. Medication offered but not forced. Support given in a non-confrontational way that recognised the confusion and anger of the patient. Seclusion abandoned. Very unfortunately, no outcome data for this experiment were reported.

Another interpretation of the finding that acute ward staff have lower thresholds for transfer to PICU (Bowers, Crowhurst, Alexander, Eales, Guy, & McCann 2003) might be that exposure of the PICU staff to fear inducing behaviour may have reduced their anxiety. This element does not feature in the model.

A descriptive study (Warneke 1986) claims that the use of pyjama/hospital gowns, and uniforms by staff, makes the environment clearer for disturbed and disoriented patients.

### Profile of patients

Legal status: The preponderance of UK studies show that the majority of patients in receipt of PICU care are legally detained, although the proportions are strikingly variable with a low of 26% (Mounsey 1979), most with 50-70% (Basson & Woodside 1981;Mitchell 1992;Musisi, Wasylenki, & Rapp 1989;Pereira, Beer, & Paton 1999) and a few with 80-100% (Smith 1997;Werner et al. 1983). Studies from other
countries, although more variable, still show the majority of patients overall to be formally detained. The only study making a comparison between acute unit and PICU patients was from the USA, and shows no difference in the proportions detained (Rachlin 1973).

Age: The larger number of studies give a mean age for PICU patients in their 30s (Basson & Woodside 1981; Cohen & Khan 1990; Eaton & Ghammad 2000; Goldney, Bowes, Spence, Czechhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986; Gordon, Hammond, & Veeramani 1998; Hyde, Harrowa-Wilson, & Morris 1998; Jeffery & Goldney 1982; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Michalon & Richman 1990; Mitchell 1992; Musisi, Wasylenki, & Rapp 1989; Warneke 1986; Wykes & Carroll 1993), with one giving 27 years (Rachlin 1973), one 29 years (Walker, Seifert, & Walker 1994) and another 40 years (Palmstierna, Huitfelt, & Wistedt 1991). However, even within the studies quoting mean ages between 30 and 39, there is considerable variation. In the five studies comparing general and PICU patients at the same hospitals, PICU patients were consistently significantly younger (Brown & Bass 2004; Cohen & Khan 1990; Gordon, Hammond, & Veeramani 1998; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Rachlin 1973).

Diagnosis: Most UK studies display a remarkable consistency, with the largest diagnostic group being schizophrenia accounting for about 50% of patients, and the next largest being mania at about 20% (Basson & Woodside 1981; Brown & Bass 2004; Cooper, Brown, McLean, & King 1983; Feinstein & Holloway 2002; Goldney, Bowes, Spence, Czechhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986; Hyde, Harrowa-Wilson, & Morris 1998; Lee, Schwartz, & Hallmayer 2000; Michalon & Richman 1990; Mitchell 1992; Musisi, Wasylenki, & Rapp 1989; Palmstierna, Huitfelt, & Wistedt 1991; Pereira et al. 2006a; Pereira et al. 2006b; Saverimuttu 1996; Saverimuttu & Lowe 2000; Smith & Humphreys 1997; Smith 1997; Wynaden et al. 2001). The less well represented diagnostic groups vary quite widely and it is hard to identify common trends because of the different systems and nomenclatures used. Nevertheless the following groups crop up with some regularity: personality disorder (Basson & Woodside 1981; Brown & Bass 2004; Feinstein & Holloway 2002; Hyde, Harrowa-Wilson, & Morris 1998; Mitchell 1992; Musisi, Wasylenki, & Rapp 1989; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b; Saverimuttu 1996; Saverimuttu & Lowe 2000; Smith & Humphreys 1997) and substance/alcohol use (Brown & Bass 2004; Feinstein & Holloway 2002; Goldney, Bowes, Spence, Czechhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986; Hyde, Harrowa-Wilson, & Morris 1998; Michalon & Richman 1990; Mitchell 1992; Musisi, Wasylenki, & Rapp 1989; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b; Saverimuttu 1996; Saverimuttu & Lowe 2000; Smith 1997). Some reported PICUs have significantly different diagnostic profiles, (Birnie & Natsuna 1988; Coldwell & Naismith 1989; Dolan & Lawson 2001a; Dolan & Lawson 2001b; Hyde, Waller, & Wyn-Pugh 1992; Jones 1985; Warneke 1986; Werner, Yesagave, Becker, Brunsting, & Issacs 1983), although the majority of these are in non-UK countries or specialist settings. In the one UK study comparing general and PICU patients, PICU patients were significantly more likely to suffer from schizophrenia, mania and drug induced psychosis, and less likely to suffer from depression (Brown & Bass 2004). Specialist settings tended to show a different diagnostically nuanced emphasis (Coldwell & Naismith 1989; Dolan &
Lawson 2001a; Dolan & Lawson 2001b; Gordon, Hammond, & Veeramani 1998), although most still report an over representation of schizophrenia on the PICU. Two studies at the same hospital showed no diagnostic differences between PICU and general patients (Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Rachlin 1973).

Employment: Few studies note the employment rates amongst PICU patients. Of those that do, reported rates of unemployment are high, from 78% (Feinstein & Holloway 2002) to 100% (Cohen & Khan 1990). The latter study shows a significant difference with general patients, whose unemployment rate was 95.5%.

Ethnicity: Various mixtures of ethnicities have been reported from different locations. Given the differences in local minority populations, little can be deduced from this. However a number of studies in the UK have compared the ethnic mix of the PICU population with either that of the wards from which it is drawn, or the local populations which are served. Both show that Caribbean patients are over represented, and white patient under represented (Brown & Bass 2004; Feinstein & Holloway 2002; Gordon, Hammond, & Veeramani 1998; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b). Two studies show Black African patients are over represented on the PICU (Feinstein & Holloway 2002; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b). One US study shows no ethnic differences between PICU and non-PICU patients (Rachlin 1973).


Interactions: One study of 13 PICUs (Mitchell 1992) contrasted patients over and under 30. Younger patients were more likely to come from the short stay admission wards, more likely to be diagnosed with PD or substance use, more likely to have absconding or suicidal behaviour as reasons for admission. Older patients were more likely to be transferred from long stay wards, suffer from affective disorder, and be more likely to have behavioural problems as a reason for transfer to the PICU. There was no difference between the age groups for violence, severe psychotic symptoms or schizophrenia. A number of studies showed an association between female gender and self-harm (Brown & Bass 2004; Rachlin 1973; Smith & Humphreys 1997). Interactions around ethnicity have been explored by a few studies (Dolan & Lawson 2001a; Dolan
Forensic history: UK surveys show that the majority (but not all) PICUs accept transfers from prison, and that a minority of PICUs accept patients from court, the police, or from medium secure units (Beer, Paton, & Pereira 1997; Pereira, Beer, & Paton 1999), whereas 26% would not accept forensic patients at all. Given this variability the proportion of 'forensic' patients on any one unit seems to vary: 12% (Mitchell 1992); 19% (Brown & Bass 2004); 30% (Basson & Woodside 1981); 32% (Eaton & Ghannon 2000). However there is no doubt that many PICU patients have a criminal history of some sort, whether they are counted as 'forensic' admissions at the time or not: 15% (Hyde, Harrowa-Wilson, & Morris 1998); 44% (Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b); 59% (Eaton & Ghannon 2000). The majority of these were violent offences.

Marital status: A few studies report this item, and those that do show that the majority of PICU patients are single (Basson & Woodside 1981; Brown & Bass 2004; Feinstein & Holloway 2002; Mitchell 1992; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b). Only one study reports the proportion of singletons less than half (Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986). While one US study (one PICU) reports no difference between PICU and other patients (Rachlin 1973), a UK study (one PICU) reports greater numbers of PICU patients are single (Brown & Bass 2004).

Other conflict and containment

Relationship to other containment measures: A number of studies report or mention other types of containment used while patients are in PICU care: medication (coerced or rapid tranquillisation or pm) (Brown & Bass 2004; Cornwall, Hassanyeh, & Horn 1996; Hyde, Harrowa-Wilson, & Morris 1998; Musisi, Wasylekni, & Rapp 1989; O'Brien & Cole 2004b; Rachlin 1973; Wynaden, McGowan, Chapman, Castle, Lau, Headford, & Finn 2001); seclusion (Brown & Bass 2004; Cohen & Khan 1990; Ford & Whiffin 1991; Hafner, Lammersma, Ferris, & Cameron 1989; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Michalon & Richman 1990; O'Brien & Cole 2004b; Wynaden, McGowan, Chapman, Castle, Lau, Headford, & Finn 2001); special observation (Citrome, Green, & Fost 1994; Hyde & Harrower-Wilson 1996); mechanical restraint (Cohen & Khan 1990; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Michalon & Richman 1990). The general impression conveyed is that such measures are used more frequently within a PICU environment than on general acute wards, and this impression is confirmed by the one study offering comparative information on 165 PICU and 165 admission ward patients (Brown & Bass 2004), showing greater use of rapid tranquillisation and seclusion.

Relationship to conflict behaviour: Conflict behaviours are the admission criteria for PICU care. Some studies report on conflict behaviour within the PICU, primarily violence (Cooper, Brown, McLean, & King 1983; Eaton & Ghannon 2000; Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986; Hyde, Harrowa-Wilson, & Morris 1998; Hyde & Harrower-Wilson
1996; Saverimuttu & Lowe 2000; Wynaden, McGowan, Chapman, Castle, Lau, Headford, & Finn 2001), but also absconding (Rachlin 1973) and self-harm (Saverimuttu & Lowe 2000). Just as with other containment measures, this conveys the impression of higher rates on the PICU, but only one study provides comparative information using the same measures (Brown & Bass 2004), and shows PICU patients are twice as likely to abuse substances and three times more likely to be violent.

**Duration of PICU care (specialist settings excluded)**

Most studies have reported mean lengths of stay, with the unfortunate result that small numbers of outlying longer stay patients skew the figures. This is demonstrated by lengths of stay at the top end of quoted ranges of: 51 days (Musisi, Wasylenki, & Rapp 1989); 131 days (Hyde, Harrowa-Wilson, & Morris 1998); 365 days (Hyde, Waller, & Wyn-Pugh 1992); "many months" (Citrome, Green, & Fost 1994); "more than a month" (Smith & Humphreys 1997); or by large differences between median (smaller) and mean (larger) lengths of stay where both are provided (Basson & Woodside 1981; Citrome, Green, & Fost 1994). With this in mind 11 studies of one or two units cite mean lengths of stay of 7 days or less (Basson & Woodside 1981; Birnie & Natsuna 1988; Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986; Hafner, Lammersma, Ferris, & Cameron 1989; Jeffery & Goldney 1982; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987; Michalon & Richman 1990; Musisi, Wasylenki, & Rapp 1989; Saverimuttu 1996; Warneke 1986; Wynaden, McGowan, Chapman, Castle, Lau, Headford, & Finn 2001), 5 studies one to two weeks (Dernovsek et al. 2003; Feinstein & Holloway 2002; Hyde & Harrower-Wilson 1996; Jones 1985; Palmstierna, Huifelt, & Wistedt 1991), and 3 studies more than two weeks (Brown & Bass 2004; Citrome, Green, & Fost 1994; Hyde, Waller, & Wyn-Pugh 1992). Two surveys of PICUs completed in the UK also provide contradictory data, with PICU consultant psychiatrists in Scotland saying 7 days (Smith 1997), PICU ward managers in England citing 22 days for acute units and 45 days for acute and forensic units (1474). It would appear that in most units the majority of patients stay a week or less, but that there is a smaller group of longer staying patients, possibly associated to some degree with forensic cases.

**Recidivism and readmission to the PICU**

Figures on readmission rates are difficult to compare, as the periods covered differ between studies.

Studies of approximately six months: 13% (Musisi, Wasylenki, & Rapp 1989); 17% (Walker, Seifert, & Walker 1994); 25% (Hyde & Harrower-Wilson 1996); 28% (Palmstierna, Huifelt, & Wistedt 1991).

Studies of approximately one year: 9% (Lee, Schwartz, & Hallmayer 2000); 16% (Birnie & Natsuna 1988); 17% (Cornwall, Hassanyeh, & Horn 1996); 34% (Eaton & Ghanmond 2000); 35% (Warneke 1986).
Studies citing data on any previous PICU admission: 31% (Saverimuttu 1996); 35% (Mitchell 1992); 36% (Brown & Bass 2004); 66% (Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b).

Studies not fitting any of the above categories: 27% over 2.5 years (Jeffery & Goldney 1982); 29% over 3 years (Michalon & Richman 1990); 49% over 3.5 years (Goldney, Bowes, Spence, Czechhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986); 57% over 5 years (Smith & Humphreys 1997).

Figures based on surveys of numerous PICUs have been asterisked, and their findings should be given extra weight. One additional study found a link between aggressive behaviour and recidivism, with a readmission rate of 61% over 8 years for violent patients (Citrome, Green, & Fost 1994).

Although these figures vary, it seems clear that overall about one third or more of PICU patients are likely to be readmissions. However it is unclear why units vary so much between each other, and there remain questions about what types of patients are more likely to be readmitted and why.

**Size, security and staffing**

Two surveys, one conducted in London and one in Scotland, give mean bed numbers of 11 (Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b) and 16.8 (Mitchell 1992). Most other studies are descriptions of one or two units, and the mean bed numbers of UK described in PICUs (n=15) is 13.

Population in 000's per PICU bed:
- 7.5 (Dernovsek, Novak-Grubic, Tavcar, & Zmitek 2003) Slovenia
- 13 (Palmstierna, Huitfelt, & Wistedt 1991) Sweden
- 16 (Dernovsek, Novak-Grubic, Tavcar, & Zmitek 2003) Slovenia
- 32 (Rachlin 1973) USA (South Bronx)
- 40 (Smith & Humphreys 1997) UK
- 170 (Lee, Schwartz, & Hallmayer 2000) Australia

Surprisingly, although most PICUs are constantly locked, some are not, only being locked at the discretion of the nurse in charge (Beer, Paton, & Pereira 1997; Dix 1995; Pereira, Beer, & Paton 1999) and one not being locked at all (Warneke 1986). Full descriptions of the staffing of PICUs are rare. Some studies mention the contribution of Occupational Therapists or Psychologists (Allan, Brown, & Laury 1988; Basson & Woodside 1981; Beer, Paton, & Pereira 1997; Citrome, Green, & Fost 1994; Smith & Humphreys 1997). Seven studies provide rudimentary information on nurse to patient daytime staffing ratios, which are as follows:
- 1:1.2 (Walker, Seifert, & Walker 1994)
- 1:1.5 (Musisi, Wasylkenki, & Rapp 1989)
- 1:2.33 (Birnie & Natsuna 1988)
- 1:2.5 (Basson & Woodside 1981; Smith & Humphreys 1997)
- 1:2.75 (Mounsey 1979)
• 1:2.67 (Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986)

Criteria for use (admission criteria)

Some papers give detailed information on the proportion of patients admitted to the PICU for different reasons, whereas others just outline broadly the admission criteria in use. Of those that provide detailed information, most agree that aggression is the most prevalent reason for transfer (Dolan & Lawson 2001a; Dolan & Lawson 2001b; Gordon, Hammond, & Veeramani 1998; Mitchell 1992; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b; Smith & Humphreys 1997; Smith 1997), accounting for 30-50% of admissions. One Canadian and one US study differed, giving suicide risk (Warneke 1986) and risk of absconding as the primary reason (Rachlin 1973). The same studies showed risk of absconding (in non forensic settings) and generally disruptive or acutely psychotic behaviour are the next most common reasons for admission, accounting for 10-20% of admissions each. Self-harm and/or suicide risk accounted for 10-15% of admissions.

Other criteria from PICU care mentioned by studies may overlap to some degree with those already mentioned:

• Safe and secure assessment of the unpredictable patient (Dix 1995)
• Catatonic and/or profoundly depressed patients with poor food/fluid intake (Goldney, Bowes, Spence, Czeckhowicz, & Hurley 1985; Goldney, Spence, & Bowes 1986)
• To provide patients with privacy and dignity not available on an open ward (Lehane & Rees 1995)

Cost

Only two studies provide any data on cost, and of these, only one is from the UK. This gave a cost per patient per annum of £103,501 based mainly on staffing costs in the mid 1990s (Hyde & Harrower-Wilson 1996). The other study, from Canada, gives a cost of $365 per patient per day compared to $235 for acute unit (Birnie & Natsuna 1988). This is perhaps best interpreted as PICU care costing 55% more than acute care.

Efficacy

One study looked at the impact of opening a PICU on the remainder of the psychiatric unit, in a before and after natural experiment design carried out retrospectively using official records (Musisi, Wasylenki, & Rapp 1989). Differences for the whole unit (including the PICU) for the first 6 months after it opened were: staff accidents 50% down, patient accidents 60% down, time lost to injuries at work 38% down, nurse absenteeism 38% up, constant observation hours 90% down, seclusion hours 92% down and numbers of patients in seclusion 83% down. These are impressive figures.
Two studies at the same unit have compared the rate of recovery using research scales, over the first 48 hours of admission, of psychotic patients admitted to either an acute ward or a PICU (Cohen & Khan 1990; Khan, Cohen, Chiles, Stowell, Hyde, & Robbins 1987). Patients were not randomised between the two groups, but were shown to be equally symptomatic on admission. In this case the PICU was a highly structured unit that kept patients confined to their rooms with minimal contact with staff over the first 48 hours, often formally secluded or mechanically restrained. Therefore it is not clear that this is a test of what would be recognised in the UK as PICU care. It would appear all ratings were also done by the researchers, who ran the PICU and may therefore have been biased. Nevertheless, PICU patients improved dramatically more than ordinary acute ward patients in both studies.

Initiations and terminations

The papers provided no information on who took decisions to initiate or terminate PICU care, or how those decisions were taken.

Patient perceptions

There is only one study where 37 discharged patients returned satisfaction questionnaires about PICU care (Wykes & Carroll 1993). Of these 37, 78% had a diagnosis of psychosis, the mean age was 34 years, 60% were male and 49% white British, i.e. the sample was well representative of PICU patients. Overall most patients were satisfied with their care, and there were no differences by age, gender, ethnicity, diagnosis, or total number of admissions, although the sample size and therefore the power was small. Most areas asked about specifically were rated positively. Of the different professions, domestics were rated the highest, followed by OTs and SWs; nurses, doctors and psychologists were the lowest. Dissatisfaction was mainly linked to staff availability to listen to patients. Patients were least satisfied with the locked door, and this was the most frequently mentioned ‘worst’ aspect of PICU care. The best aspect was the staff and their helpfulness. A comparison survey was conducted with acute ward patients, and no differences found.

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