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PSYCHIATRIC INTENSIVE CARE UNITS: A LITERATURE REVIEW

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PSYCHIATRIC INTENSIVE CARE UNITS: A LITERATURE REVIEW

ABSTRACT

Background: Psychiatric Intensive Care Units (PICU) have been part of most inpatient psychiatric services for some time, however information about their functioning and outcome has not previously been collated.

Aim: To conduct a systematic literature review to assess the current state of knowledge about such services.

Method: A search of electronic databases was undertaken, followed by obtaining additional references from items obtained.

Results: Over 50 papers in English containing some empirical data were identified. Most studies were retrospective. Typical PICU patients are: male; younger; single; unemployed; suffering from schizophrenia or mania; from a black Caribbean or African background; legally detained; with a forensic history. The most common reason for admission is for aggression management, and most patients stay a week or less. Evidence of the efficacy of PICU care is very poor.

Conclusions: Most research so far has been small scale, and more substantial work using better methodologies is clearly required.

PSYCHIATRIC INTENSIVE CARE UNITS: A LITERATURE REVIEW

Background and history

There is no detailed history of the use of psychiatric intensive care in the UK or its antecedents. 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. Community care became 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 accelerated 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 facilities 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 varyingly 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, mentally 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 (Department of Health 1992).

What is a PICU?

First descriptions of 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, Wasylenki, & 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

design 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 expect in countries that have multiple overlapping health care systems. For example, one studied unit placed 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).

METHODS

Literature search strategy

A search was conducted using electronic reference databases (CINAHL and PSYCINFO) using the search terms intensive care, extra care, special care and high dependency. Further references were obtained by a process of snowballing and from two previously published discussion papers (Crowhurst & Bowers 2002;O'Brien & Cole 2003). This review covers published papers in the English language up to March 2006.

Procedure

A matrix was constructed with a number of headings including: the methodology, sample, definitions and setting used in the article; the patient profiles (age, gender, ethnicity, diagnosis, marital status); the rates of occurrence of PICU care; times and places or occurrence of PICU admissions/transfers; the patient's perceptions of the PICU; administration and regulation of PICU care; circumstances of PICU admissions/transfers; antecedents and causes of PICU admissions/transfers; relationships between other types of conflict/containment events and PICU care; economics and cost of PICU care; and efficacy and outcome of PICU care. Each article was reviewed, extracting data/evidence for the relevant sections in the matrix in addition to the quality and rigour of each study. Once the matrix was complete, each topic was summarised, with the greatest weight being given to (i) studies conducted in the UK, and (ii) with the strongest research design (in descending order: randomised trials, trials with controls, trials without controls (before and after), natural experiments, retrospective/official records, observational). Findings from surveys conducted across many units were given greater weight than reports from single units.

Overview of study methodologies

The vast majority of studies are retrospective, descriptive and dependent upon official records. Some of these are now over 30 years old, and may not reflect current healthcare practice, and the reliance on official recording systems means that they report different features, and may be inaccurate or subject to unknown biases. Only a few of these have used a comparison group of non-PICU patients so that differences

can be identified, however in some cases the comparison group is all other patients at the same hospital. The strongest comparative survey is that of Brown & Bass (2004), who compared PICU patients with a randomly selected sample of patients on ordinary acute admission wards in the same locality. Several surveys have taken place in the UK, were of varying scope, and are reported with varying degrees of detail and rigor. Only three studies have attempted to measure outcome. One was a before and after study in the form of a natural experiment. The other two were non-randomised studies of the clinical improvement of PICU and non-PICU patients, where raters were not blinded to condition, and with a very short-term outcome period of 48 hrs.

FINDINGS

Profile of patients

Age: The majority of studies give a mean age for PICU patients in their 30s (see Table 1), with one giving 27 years (Rachlin 1973), one 29 years (Walker, Seifert, & Walker 1994) and another 40 years (Palmstierna, Huitfelt, & Wistedt 1991). 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 (see Table 1).

Gender: Nearly all studies show the majority of PICU patients to be male (see Table 1), the exceptions being few (Gordon, Hammond, & Veeramani 1998; Mounsey

1979;Warneke 1986). Where comparisons have been made, PICU patients are more likely to be male than non-PICU patients (see Table 1).

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% (see Table 1). 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 and substance/alcohol use (see Table 1). 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 et al. 1983), although the majority of these are in non-UK countries or forensic units. 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 diagnostic 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).

Ethnicity: A variety of combination of ethnic groups have been reported from different locations. Given the differences in local minority populations, little can be

deduced from this. 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. All show that Caribbean patients are over represented, and white patient under represented (Brown & Bass 2004;Feinstein & Holloway 2002;Gordon, Hammond, & Veeramani 1998;Pereira et al. 2006a;Pereira et al. 2006b). Two studies show that 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).

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, Yesagave, Becker, Brunsting, & Issacs 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).

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).

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%.

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). 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.

Interactions between profile elements: 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, and 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 & Lawson 2001b; Feinstein & Holloway 2002; Pereira, Sarsam, Bhui K., & Paton 2006a; Pereira, Sarsam, Bhui K., & Paton 2006b), but not enough work has been done to show any consistent pattern of linkage between ethnicity and other variables.

Reasons for admission to PICU care

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, accounting for 30-50% of admissions (see Table 1). 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. One Canadian and one US study differed from this account, giving suicide risk (Warneke 1986) and risk of absconding as the primary reason (Rachlin 1973).

Other criteria for PICU care mentioned by some 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).

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, Harrower-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 (see Table 1)
- 5 studies of one or two units cite one to two weeks (Dernovsek et al. 2003; Feinstein & Holloway 2002; Hyde & Harrower-Wilson 1996; Jones 1985; Palmstierna, Huitfelt, & Wistedt 1991)
- 3 studies of one or two units cite 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), thus largely agreeing with other sources above, and PICU ward managers in England citing 22 days for acute units and 45 days for acute and forensic units (Ford & Whiffin 1991). Both these latter surveys solicited professional opinion on length of stay, rather than actually collating data. 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 issues.

The incidence and management of dangerous and disruptive behaviour

High risk behaviours are reasons for admission to PICU care, and these behaviours continue to be frequent during patients stay. Some studies report on violence (see Table 1), others absconding (Rachlin 1973) and self-harm (Saverimuttu & Lowe 2000). 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 than patients on acute wards.

A number of studies report or mention other types of containment used while patients are in PICU care: medication (coerced or rapid tranquillisation or PRN, see Table 1) ; 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 2004;Wynaden et al. 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 (Brown & Bass 2004), showing greater use of rapid tranquillisation and seclusion.

Recidivism and readmission to the PICU

Figures on readmission rates are difficult to compare, as the periods covered differ between studies (the longer the time period covered, the more likely the readmission rate to be higher).

Studies of approximately six months in duration:

- 13% (Musisi, Wasylenki, & Rapp 1989)
- 17% (Walker, Seifert, & Walker 1994)
- 25% (Hyde & Harrower-Wilson 1996)
- 28% (Palmstierna, Huitfelt, & Wistedt 1991).

Studies of approximately one year in duration:

- 9% (Lee, Schwartz, & Hallmayer 2000)
- 16% (Birnie & Natsuna 1988)
- 17% (Cornwall, Hassanyeh, & Horn 1996)
- 34% (Eaton & Ghannon 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, Czeckhowicz, & 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, however even these figures vary substantially, possibly because of the different locations of the surveys (Scotland versus London) and/or because of changes occurring over time to the healthcare system over the intervening 14 years. 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.

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, from which the mean bed numbers across 15 UK PICUs can be derived, and is 13.

Population in thousands per PICU bed is provided by only five studies:

- 7.5 (Dernovsek, Novak-Grubic, Tavcar, & Zmitek 2003) Slovenia
- 13 (Palmstierna, Huitfelt, & Wistedt 1991) Sweden
- 16 (Dernovsek, Novak-Grubic, Tavcar, & Zmitek 2003) Slovenia (two PICUs serving different districts are compared in this study)
- 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, Wasylenki, & 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)

Cost

Only two studies provide any data on cost, and of these, only one is from the UK.

This gives 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 an 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. It is difficult to know whether these substantial changes represent a true effect of the PICU opening, or simply natural variation over time.

Two studies conducted 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. This particular 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 (on rated symptomatology) than ordinary acute ward patients in both studies.

Initiations and terminations

The papers reviewed 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.

DISCUSSION AND SUMMARY

In comparison to general acute ward patients, the typical PICU patient is more likely to be: male; younger; single; unemployed; suffering from schizophrenia or mania; from a black Caribbean or African background; legally detained; with a forensic history (most commonly for violent offences). The most common reason for admission to the PICU is for aggression management, followed in rank order by generally disruptive behaviour and suicide risk. However the operationalisation of these criteria can be contentious (Bowers et al. 2003). Once in the PICU, patients are more likely to be violent and/or abuse substances, and more likely to be secluded or

receive coerced IM medication. Despite this, in the one survey that has been carried out, discharged patients are satisfied with the care they received. Most patients stay a week or less, but there is a smaller group of longer term difficult-to-manage patients who have substantial admissions. This is confirmed by recent Mental Health Act Commission work finding that a large number of patients whose discharge is delayed and who have excessively long admissions are not on general acute wards, but on PICUs (personal communication).

About a third of patients have had a previous PICU admission, although this varies widely by unit. PICUs tend to have small numbers of beds (10-15), and a nurse on duty to patient staffing ratio of approximately 1:2. There is no norm of number of beds to the general population served – indeed there is little information about this in the literature. Guidance on appropriate levels of bed numbers and on staffing levels are strikingly absent from UK Government policy (Department of Health 2002).

There is also little hard information in the literature on cost, but PICUs are certainly more expensive than acute ward care. Evidence of the efficacy of PICU care is very limited.

Given the cost of PICU care, and the fact it has been provided for at least 40 years (with a substantial expansion during the 1980s), it might be expected that there would be a substantial body of research and evidence on efficacy. This is not the case, and what little evidence there is particularly weak. PICUs could be effective in two ways: (i) through keeping patients and staff safer than possible on generic acute wards, and (ii) through speeding recovery via more intensive treatment. Either of these is yet to

be established. Further research of a significantly better size, scope and quality is therefore required.

There are many other streams of research that are applicable to PICU care, particularly those on inpatient violence and self-harm, and the pharmacological management of acute illness. Although we have good information on the profile of patients receiving PICU care, more information on the number of beds to general population, size, staffing, therapeutic regime and outcome is required.

Although the broad admission criteria are known, how these are actually used in different settings is less clear. For example exactly how aggressive does a patient have to be to merit transfer? This question and others like it may have different answers in different places, and is thus inextricable from the related question of efficacy. It seems likely that answers to these questions will also be related to the availability of forensic mental health services and to relationships with local police forces, but no studies have so far explored this, or how it relates to outcome. More information on these issues would assist in the planning and management of services.

The psychiatric staff who operate PICUs are to be applauded for the largely descriptive research they have carried out so far. PICUs are a major and costly part of psychiatric care provision, but have received no substantive, grant funded research attention. This is wholly anomalous, and needs to be rectified.

Table 1: Summary of papers

Papers indicating patients mean age in 30s		
Basson & Woodside 1981 Cohen & Khan 1990 Eaton & Ghannon 2000 Goldney et al 1985 Goldney et al 1986	Gordon et al 1998 Hyde et al 1998 Jeffery & Goldney 1982 Khan, et al 1987 Michalon & Richman 1990	Mitchell 1992 Musisi et al 1989 Warneke 1986 Wykes & Carroll 1993
Patients giving evidence that PICU patients are younger than general acute patients		
Brown & Bass 2004 Cohen & Khan 1990	Gordon et al 1998 Khan et al 1987	Rachlin 1973
Papers indicating the majority of PICU patients male		
Basson & Woodside 1981 Beer, Paton, & Pereira 1997 Birnie & Natsuna 1988 Dolan & Lawson 2001a Dolan & Lawson 2001b Eaton & Ghannon 2000 Goldney et al 1985 Goldney et al 1986	Hyde et al 1998 Jeffery & Goldney 1982 Michalon & Richman 1990 Mitchell 1992 Musisi et al 1989 O'Brien & Cole 2004 Palmstierna et al 1991 Pereira et al. 2006a	Pereira et al. 2006b Pereira, Beer, & Paton 1999 Saverimuttu 1996 Saverimuttu & Lowe 2000 Smith & Humphreys 1997 Smith 1997 Wykes & Carroll 1993 Wynaden et al. 2001
Papers indicating PICU patients are more likely to be male than general acute patients		
Brown & Bass 2004 Cohen & Khan 1990)	Feinstein & Holloway 2002 Hyde et al 1992	Khan et al 1987 Rachlin 1973
Papers indicating the largest groups of PICU patients suffer from schizophrenia or mania		
Basson & Woodside 1981 Brown & Bass 2004 Cooper et al. 1983 Feinstein & Holloway 2002 Goldney, Bowes, Spence, Czechowicz, & Hurley 1985 Goldney et al 1986	Hyde et al 1998 Lee et al 2000 Michalon & Richman 1990 Mitchell 1992 Musisi et al 1989 Palmstierna et al 1991 Pereira et al. 2006a	Pereira et al. 2006b Saverimuttu 1996 Saverimuttu & Lowe 2000 Smith et al 1997 Smith 1997 Wynaden et al. 2001
Papers showing a significant presence on the PICU of patients with personality disorder		
Basson & Woodside 1981 Brown & Bass 2004 Feinstein & Holloway 2002 Hyde et al 1998	Mitchell 1992 Musisi et al 1989 Pereira et al. 2006a Pereira et al. 2006b	Saverimuttu 1996 Saverimuttu & Lowe 2000 Smith & Humphreys 1997
Papers showing a significant presence on the PICU of patients with substance or alcohol use problems		
Brown & Bass 2004 Feinstein & Holloway 2002 Goldney et al 1985 Goldney et al 1986 Hyde et al 1998	Michalon & Richman 1990 Mitchell 1992 Musisi et al 1989 Pereira et al 2006a	Pereira et al 2006b Saverimuttu 1996 Saverimuttu & Lowe 2000 Smith 1997
Papers showing aggression the most common reason for admission to the PICU		
Dolan & Lawson 2001a Dolan & Lawson 2001b Gordon et al 1998	Mitchell 1992 Pereira et al 2006a Pereira et al 2006b	Smith & Humphreys 1997 Smith 1997
Papers showing lengths of stay 7 days		
Basson & Woodside 1981 Birnie & Natsuna 1988 Goldney et al 1985 Goldney et al 1986	Hafner et al 1989 Jeffery & Goldney 1982 Khan et al 1987 Michalon & Richman 1990	Musisi et al 1989 Saverimuttu 1996 Warneke 1986 Wynaden et al. 2001
Papers describing violent behaviour on the PICU		
Cooper et al. 1983 Eaton & Ghannon 2000 Goldney, et al 1985	Goldney, et al 1986 Hyde et al 1998 Hyde & Harrower-Wilson 1996	Saverimuttu & Lowe 2000 Wynaden et al. 2001
Papers describing medication use on the PICU		
Brown & Bass 2004 Cornwall et al 1996 Hyde et al 1998	Musisi et al 1989 O'Brien & Cole 2004	Rachlin 1973 Wynaden et al 2001

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