

Suicide in mental health in-patients and within 3 months of discharge

National clinical survey[†]

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Background Suicide prevention is a health service priority. Suicide risk may be greatest during psychiatric in-patient admission and following discharge.

Aims To describe the social and clinical characteristics of a comprehensive sample of in-patient and post-discharge cases of suicide.

Method A national clinical survey based on a 4-year (1996–2000) sample of cases of suicide in England and Wales who had been in recent contact with mental health services ($n=4859$).

Results There were 754 (16%) current in-patients and a further 1100 (23%) had been discharged from psychiatric in-patient care less than 3 months before death. Nearly a quarter of the in-patient deaths occurred within the first 7 days of admission; 236 (31%) occurred on the ward, the majority by hanging. Post-discharge suicide was most frequent in the first 2 weeks after leaving hospital; the highest number occurred on the first day.

Conclusions Suicide might be prevented among in-patients by improving ward design and removing fixtures that can be used in hanging. Prevention of suicide after discharge requires early community follow-up and closer supervision of high-risk patients.

Declaration of interest L.A. is the National Director of Mental Health for England. Funding detailed in Acknowledgements.

Prevention of suicide is a priority for health services in England (Department of Health, 2002). For those in contact with psychiatric services the risk of suicide is at its highest during in-patient psychiatric care and the post-discharge period (Goldacre *et al*, 1993; Geddes & Juszczak, 1995; Appleby *et al*, 2001; Yim *et al*, 2004). Several independent risk factors have been reported to distinguish those who died as in-patients from living controls. These include involvement with the police, previous suicidal behaviour, violence to property, recent bereavement and the presence of delusions (Stebblaj *et al*, 1999; Powell *et al*, 2000; King *et al*, 2001a). Risk factors for suicide in patients discharged from in-patient care include unemployment, self-harm, suicidal ideation prior to admission, unplanned discharge and lack of continuity of care (King *et al*, 2001b; Yim *et al*, 2004). However, the majority of previous studies have been based on comparatively small numbers of cases of suicide and have provided limited information about the antecedents of the suicidal act, including clinical care during the final episode of illness. This paper describes a national consecutive series of suicides by psychiatric in-patients and patients who had been discharged from hospital in the previous 3 months. The study was carried out as part of the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (Appleby *et al*, 2001).

METHOD

Data collection had three stages: the collection of a comprehensive national sample of cases of suicide, irrespective of mental health history; the identification of people within the sample who had been in contact with mental health services in the 12 months before death; and the collection of clinical data about these people.

Comprehensive national sample

Information on all deaths in England and Wales receiving a verdict of suicide or an open verdict at coroner's inquest was obtained from the Office for National Statistics. The cases presented here consist of deaths registered from 1 April 1996 until 31 March 2000.

In the first 3 years of the study, this information was cross-checked against equivalent data from the health authorities in England and Wales; inconsistencies were rare. Open verdicts, recorded as deaths from undetermined external cause, are often reached in cases of suicide and some or all open verdicts are conventionally included in research on suicide (O'Donnell & Farmer, 1995; Neeleman & Wessely, 1997) and in official suicide statistics. In this study, open verdicts were included unless it was clear that suicide was not considered at inquest – for example, in deaths from an unexplained medical cause.

Identification of mental health service contact

Identifying details on each suicide were submitted to the main hospital and community trusts providing mental health services to people living in the deceased's district of residence. When trust records showed that contact had occurred in the 12 months before suicide, the person became an 'inquiry case'. All local mental health services in England and Wales regularly returned data to the inquiry. We arranged for cases to be directly reported from units that have multidistrict catchment areas, including regional forensic psychiatry units, or that have no catchment area, including national units and private hospitals.

An assessment of the accuracy of checks by trusts, carried out in 16 trusts in north-west England, showed that 95% of eligible cases were identified. Missed cases arose because of misspellings of names in trust records or in personal information notified to the inquiry. As a result, a checking protocol was developed and recommended to trusts.

Collection of clinical data

For each inquiry case, the consultant psychiatrist was sent a questionnaire and asked to complete it after discussion with other members of the mental health team. The questionnaire consisted of sections covering

[†]See pp. 135–142 and 143–147, this issue.

social/demographic characteristics, clinical history, details of suicide, aspects of care, details of final contact with services and clinicians' views on the immediate and long-term risk of suicide and suicide prevention. The social and clinical items reflected many of the most frequently reported risk factors for suicide. The majority of items were factual; a number (e.g. adherence to treatment) were based on the judgements of clinicians. In-patient status at the time of suicide was as reported by the clinicians. The in-patient sample included patients who were on leave at the time of death. Clinicians were also asked to record the date of the deceased's last discharge from psychiatric in-patient care. A 'post-discharge' suicide was defined as an individual who had died by suicide within 3 calendar months of this discharge date.

Statistical analysis

We considered those who died as psychiatric in-patients and those who died within 3 months of discharge as separate groups. Data on all other patients who died by suicide in the community are also presented for general comparison. Different clinical care variables were recorded for the in-patient and post-discharge groups, and these data are presented separately. We also describe the characteristics of specific subgroups of in-patients (observed patients, detained patients, early and later in-patient deaths) and post-discharge patients (those who initiated their own discharge, those who had planned discharges).

This was primarily a descriptive study and we wished to quantify the precision of our prevalence estimates. The main findings are therefore presented as proportions with 95% confidence intervals (CIs). The large sample size means that

the great majority of between-group differences were likely to be statistically significant. We therefore decided *a priori* that statistical testing would be used only for further exploration of selected differences between subgroups (e.g., comparing early and late cases of in-patient suicide, comparing those who initiated their own discharge with those who had planned discharges). For these comparisons, we used χ^2 -tests with statistical significance set at $P < 0.05$. If an item of information was not known for a case, the case was removed from the analysis of that item; the denominator in all estimates is therefore the number of valid cases for each item.

RESULTS

We received notification of 20 927 deaths by suicide, including 14 048 cases in which the coroner's verdict was suicide and 6879 open verdicts or deaths from undetermined cause. Of these, 5099 (24%, 95% CI 24–25) people were confirmed to have been in contact with mental health services in the year prior to death. Completed questionnaires were received on 4859 cases, a response rate of 95%. The findings below refer to these cases.

A total of 754 (16%, 95% CI 14–17) individuals died during an episode of in-patient care (approximately 180–190 suicides per year). A total of 1100 (23%, 95% CI 22–24) individuals died within 3 calendar months of discharge from psychiatric in-patient care (approximately 275 suicides per year).

Method of suicide

Hanging and jumping from a height were the most common methods of suicide

among the in-patient sample, accounting for two-thirds of deaths (Table 1). Of the 236 deaths that took place on the ward, 174 (73%) were by hanging. The most commonly reported ligature was a belt (19 cases) and the most commonly reported ligature point was a hook or handle (9 cases). Among the 514 patients who died away from the ward, jumping from a height or in front of a moving vehicle was the most common method (196 cases, 39%), followed by hanging (136 cases, 27%), self-poisoning (61 cases, 12%) and drowning (55 cases, 11%). Among the post-discharge sample, the most common suicide methods were hanging and self-poisoning.

Timing and location of suicide

There were 179 in-patients (24%, 95% CI 21–27) who died within 7 days of admission; 236 deaths (31%) occurred on the ward, 399 (53%) at a distance from the hospital and 101 (13%) in or near the hospital grounds. Fourteen deaths (2%) occurred at an unspecified location. In four cases, location was not known.

For cases of post-discharge suicide (Fig. 1), death was most frequent in the first 2 weeks after leaving hospital, when 337 deaths occurred (32%, 95% CI 29–34). Within this 2-week period, the greatest number of suicides (32 individuals) occurred on the first day after discharge; 397 deaths (40%, 95% CI 37–43) occurred before the first post-discharge contact in the community.

Social and clinical characteristics

In-patient suicide was characterised by numerous clinical and social indicators of suicide risk (Table 2). These included

Table 1 Method of suicide

Cause of death	Group, n (% , 95% CI)		
	In-patients (n=754)	Post-discharge patients (n=1100)	Other community patients (n=3005)
Hanging	310 (42, 38–45)	342 (32, 29–35)	933 (32, 30–34)
Self-poisoning	84 (11, 9–14)	320 (30, 27–33)	1106 (38, 36–40)
Carbon monoxide poisoning	21 (3, 2–4)	100 (9, 8–11)	220 (8, 7–9)
Jumping/multiple injuries	204 (27, 24–30)	140 (13, 11–15)	277 (10, 8–11)
Drowning	60 (8, 6–10)	70 (7, 5–8)	168 (6, 5–7)
Other ¹	65 (9, 7–11)	102 (9, 8–11)	210 (7, 6–8)

1. Includes burning, cutting, electrocution, firearms, suffocation and other specified.

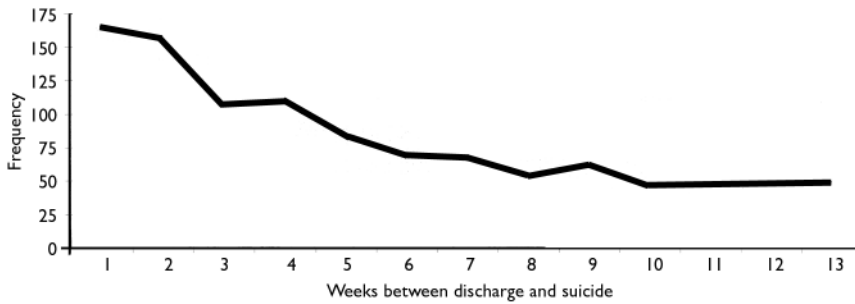


Fig. 1 Number of individuals who died by suicide per week following discharge (England and Wales Suicide Inquiry cases). Week 1=first week following discharge.

homelessness, severe mental illness, multiple previous admissions and previous self-harm. In a quarter of in-patients there was a history of non-adherence to medication. The post-discharge group was similar to the in-patient group but major mental

illness was less common and alcohol and drug dependence were more common.

Clinical care

The majority of in-patients were voluntary patients, on a general psychiatry ward and

under routine observation at the time of death (Table 3). Around a third of the sample (223 patients) were on agreed leave at the time of suicide and a quarter (169 patients) had left the ward without staff agreement; in 57 (36%) of the latter group, this occurred while the patient was under non-routine (medium- or high-level) observation. In 182 cases (27%, 95% CI 23–30), respondents reported staff shortages at the time of death. In 184 (25%, 95% CI 22–29), they reported problems in observation because of ward design. The majority of patients were judged to be at no or low immediate risk of suicide at last contact with staff. This included most of those who were on agreed leave at the time of death.

In the post-discharge group, the last admission was likely to have been a

Table 2 Social and clinical characteristics

Characteristic	Group		
	In-patients (n=754)	Post-discharge patients (n=1100)	Other community patients (n=3005)
Demographic features			
Age, years: median (range)	39 (17–89)	41 (16–92)	42 (13–95)
Male gender, n (%; 95% CI)	485 (64, 61–68)	733 (67, 64–69)	1980 (66, 64–68)
Minority ethnic group, n (%; 95% CI)	53 (7, 5–9)	62 (6, 4–7)	167 (6, 5–7)
Not currently married, n (%; 95% CI)	553 (74, 71–77)	799 (73, 70–76)	2053 (70, 68–72)
Unemployed/ long-term sick, n (%; 95% CI)	487 (65, 62–69)	642 (59, 56–62)	1636 (57, 56–59)
Living alone, n (%; 95% CI)	290 (39, 35–42)	484 (45, 42–48)	1232 (43, 41–45)
Homeless/no fixed abode, n (%; 95% CI)	64 (9, 7–11)	29 (3, 2–4)	38 (1, 1–2)
Clinical features, n (%; 95% CI)			
Primary diagnosis			
Schizophrenia and other delusional disorders	259 (34, 31–38)	188 (17, 15–19)	513 (17, 16–19)
Bipolar affective disorder	94 (13, 10–15)	89 (8, 7–10)	208 (7, 6–8)
Depressive disorder	247 (32, 30–36)	366 (33, 31–36)	1032 (35, 33–37)
Anxiety disorder	22 (3, 2–4)	36 (3, 2–4)	128 (4, 4–5)
Alcohol dependence	12 (2, 1–2)	128 (12, 10–14)	299 (10, 9–11)
Drug dependence	10 (1, 1–2)	41 (4, 3–5)	165 (6, 5–6)
Personality disorder	67 (9, 7–11)	137 (13, 11–14)	301 (10, 9–11)
Other mental disorder	36 (5, 3–6)	88 (8, 7–10)	229 (8, 7–9)
No mental disorder	3 (0.4, 0–1)	22 (2, 1–3)	79 (3, 2–3)
Any secondary diagnosis	393 (53, 49–56)	592 (55, 52–58)	1475 (51, 49–53)
Duration of history (< 12 months)	166 (22, 19–25)	280 (26, 24–29)	554 (19, 18–21)
Over five previous admissions	198 (31, 27–34)	199 (22, 19–25)	315 (11, 10–12)
Behavioural features, n (%; 95% CI)			
History of self-harm	560 (75, 72–78)	779 (71, 69–74)	1738 (59, 57–61)
History of violence	202 (27, 24–30)	228 (21, 19–24)	490 (17, 15–18)
History of alcohol misuse	244 (33, 29–36)	475 (44, 41–47)	1180 (40, 38–42)
History of drug misuse	224 (30, 27–33)	315 (29, 26–32)	809 (28, 26–29)
History of recent non-adherence	186 (26, 22–29)	222 (22, 20–25)	521 (21, 20–23)

Table 3 Details of care for those who died by suicide during psychiatric in-patient admission ($n=754$)

	<i>n</i> (% , 95% CI)
Type of ward	
General psychiatry open ward	597 (80, 77–82)
Psychiatric intensive care ward	29 (4, 2–5)
Rehabilitation ward	29 (4, 2–5)
Mental Health Act 1983 status	
Informal/voluntary	542 (72, 69–75)
Detained	209 (28, 25–31)
Observation status	
High-level observations (i.e. one-to-one)	17 (3, 1–4)
Medium-level observations (every 5–25 min)	139 (23, 19–26)
Low-level observations (every 30 min or longer)	439 (72, 68–75)
Leave status	
Agreed leave	223 (31, 27–34)
Off ward with staff agreement	75 (10, 8–13)
Off ward without staff agreement	169 (24, 20–26)
Location of suicide	
On the ward	236 (31, 28–35)
In hospital grounds	35 (5, 3–6)
Near hospital grounds	66 (9, 7–11)
Distant from hospital	399 (53, 50–57)
Immediate risk assessment	
No or low risk	590 (80, 77–83)

readmission in nearly a quarter of cases (250 patients) and to have been of less than 7 days' duration in nearly a third of cases (328 patients). Nearly a quarter of patients (245) had missed their last appointment and a fifth (203 patients) were out of contact with services at the time of death (Table 4).

Preventability

There were 219 in-patient deaths (31%, 95% CI 27–34) that were considered preventable by respondents. Respondents believed that a number of factors could have reduced risk, in particular closer supervision (325 cases, 45%, 95% CI

41–48), better adherence to treatment (167 cases, 23%, 95% CI 20–26), an increase in staff numbers (148 cases, 20%, 95% CI 17–23) and better staff training (149 cases, 20%, 95% CI 17–23).

There were 211 (21%) cases of post-discharge suicide that were regarded as preventable. Again, respondents most often thought risk could have been reduced by improved treatment adherence (319 cases, 30%, 95% CI 28–33) and closer supervision of the patient (249 cases, 24%, 95% CI 21–26).

In-patient subgroups

Observed patients

There were 156 patients (25%, 95% CI 22–29) that were under non-routine (medium- or high-level) observations at the time of suicide, including 17 (3%, 95% CI 1–4) who were under constant (one-to-one) observation. There were 84 (48%) cases of suicide by patients under observation that occurred off the ward; the majority of these (74 cases, 88%) had absconded from a general psychiatry open ward.

Among those observed patients who died on the ward, 66 (73%) died by hanging, 5 (6%) by cutting or stabbing, 4 (4%) by suffocation, 3 (3%) by self-poisoning and 2 (2%) by electrocution; 25 deaths (37%) occurred in a bathroom or toilet and 24 (36%) in a single room. For 48 (30%) of the individuals under observation, there were problems observing the patient on the ward due to ward design. Cases of suicide in those under observation were more often seen as preventable (84 cases, 53%).

Detained patients

There were 209 in-patients (28%, 95% CI 25–31) that were detained under the Mental Health Act 1983 at the time of suicide. Of these, 65 (31%) were under special observations; 25 deaths (12%) occurred within 7 days of admission; 132 (63%) died off the ward. The most common method of death was hanging (91 cases, 44%).

Early v. later deaths

Those who died within 7 days of admission differed from those who died later in their admission. The former were more likely to die on the ward (40 v. 29%, $\chi^2=8.4$, $P<0.01$), whereas the latter were more likely to die at a distance from the hospital (56 v. 44%, $\chi^2=7.7$, $P<0.01$). Those who died early were more likely to have been

Table 4 Details of care for those who died by suicide within 3 months of discharge from psychiatric in-patient care ($n=1100$)

	<i>n</i> (% , 95% CI)
Last admission	
Readmission within 3 months	250 (23, 20–26)
Detained under the Mental Health Act 1983	170 (16, 13–18)
Duration less than 7 days	328 (30, 27–33)
Ended in patient-initiated discharge	305 (28, 25–31)
Follow-up arranged	985 (92, 90–93)
Contact with services	
Under CPA	636 (58, 55–61)
Key worker allocated	801 (75, 72–77)
Psychiatric symptoms at last contact	623 (59, 56–62)
Missed last appointment	245 (23, 20–25)
Out of contact at time of suicide	203 (19, 16–21)

CPA, care programme approach.

admitted informally (86 *v.* 68%, $\chi^2=22.7$, $P<0.001$) but were also more likely to be on non-routine observations (36 *v.* 16%, $\chi^2=34.5$, $P<0.001$). The risk of suicide was considered to be low or absent in a higher proportion of late cases of suicide (83 *v.* 70%, $\chi^2=14.5$, $P<0.001$).

Post-discharge patient subgroups

Patient-initiated discharge

Self-discharges and discharges from in-patient care requested by the patient were grouped together as 'patient-initiated discharge' and compared with planned discharges. There were 305 cases of suicide in the patient-initiated discharge group (28% of the post-discharge sample, 95% CI 25–31). The timing of suicide in the patient-initiated discharge group followed the pattern of the post-discharge group as a whole, with a peak of deaths during the first 2 weeks after hospital discharge. Compared with those who had planned discharges, the patient-initiated discharge group were more likely to have a primary diagnosis of personality disorder (16 *v.* 11%, $\chi^2=4.7$, $P=0.03$), a history of violence (26 *v.* 20%, $\chi^2=5.2$, $P=0.02$) or drug misuse (34 *v.* 27%, $\chi^2=4.6$, $P=0.03$). They were less likely to be subject to continuing community care ('enhanced' care programme approach, 46 *v.* 63%, $\chi^2=27.4$, $P<0.001$), were more likely to have missed their last appointment (27 *v.* 21%, $\chi^2=4.9$, $P=0.03$), had more symptoms at their final contact (66 *v.* 56%, $\chi^2=7.9$, $P<0.01$) and were more often out of contact with services at the time of suicide (29 *v.* 14%, $\chi^2=32.7$, $P<0.001$).

DISCUSSION

We have described a 4-year national sample of cases of suicide among psychiatric in-patients and those who died within 3 months of discharge from psychiatric in-patient care. Over 180 psychiatric in-patients per year died by suicide in the study period. This represented 16% of cases of suicide by those in contact with mental health services, and 4% of cases of suicide in the general population. The number of patients who died by suicide in the 3 months following discharge from psychiatric in-patient care was approximately 275 per year. This represented 23% of cases in contact with mental health services and 5% of cases of suicide in the general population. In total, therefore, around

450 mental health patients died by suicide each year during or soon after in-patient admission. This represents 39% of patient suicides and 9% of general population suicides.

The majority of cases of in-patient suicide were by hanging. Around a quarter died within 7 days of admission. A third died on the ward, a quarter had left the ward without staff agreement and the remainder were on leave or off the ward with agreement. Around a quarter were under non-routine observations at the time of death, yet in almost half of these cases the patient had left the ward. Three per cent were under high-level (one-to-one) observations at the time of death. The patients in this study had high rates of severe mental illness and of indicators of suicide risk but most were thought to be at low or no risk at last contact with staff. Around one-third of the deaths were considered preventable, including half of those who died while under non-routine observations.

Post-discharge suicide was most frequent in the first 2 weeks after leaving hospital. Forty per cent of deaths occurred before the first follow-up appointment. Post-discharge cases had characteristics which suggested a disrupted pattern of care at the time of final admission. In almost a quarter the final admission had been a readmission within 3 months of previous discharge and in almost one-third the final admission had lasted less than 7 days. Over one-quarter of post-discharge deaths occurred in the patient-initiated discharge group and there was further evidence of disengagement from care in this group prior to suicide.

Methodological issues

The sample size in this study is larger than has been possible in previous clinical studies and data collection is almost complete. However, several methodological limitations must be highlighted. First, this report is a survey of clinical circumstances preceding suicide. Although uncontrolled national studies of suicide can be informative (Lönnqvist, 1988), aetiological conclusions are difficult to draw without a comparison sample. The fact that psychiatric in-patients who die by suicide have a high rate of schizophrenia, for example, does not mean that schizophrenia carries a higher risk in this group, because schizophrenia is likely to be common in any psychiatric in-patient

sample. However, the findings do show the groups in whom suicide must be reduced if a reduction in in-patient suicide is to be achieved. Controlled studies of subgroups of patients are currently in progress at the National Confidential Inquiry. Second, the information from clinicians was based on case records and clinical judgements rather than standardised assessments. However, a number of suicide studies have relied on similar methods (King *et al.*, 2001a). In addition, the reliability and validity of Inquiry questionnaire data have been shown to be good (Appleby *et al.*, 1999b). Third, the clinicians who provided the information were not masked and may have been biased by their awareness of outcome. It is possible that clinicians may have filled certain sensitive items defensively (for example, estimating suicide risk at last contact, commenting on staff shortages at the time of death).

Clinical implications

These findings suggest a number of measures that may reduce the number of deaths by in-patient suicide. The ward environment should be regularly reviewed and potential ligature points removed. Close supervision on the ward is required for patients at risk in the first few days after admission; this may include closer observation of ward exits to prevent absconding. Regular risk assessment and closer supervision at home is needed when patients have recovered enough to be given leave. Training of staff should include information about suicide risk during apparent recovery.

The findings raise particular concern about observation on in-patient units. According to respondents, some wards make observation difficult because of their design – in our opinion, these are unsuitable for the care of suicidal people. A substantial minority of in-patient deaths occurred during intermittent observation. This method of ensuring safety has not been subject to rigorous testing and its value must be in doubt.

A high risk of suicide following discharge from in-patient care has previously been reported (Goldacre *et al.*, 1993; Geddes & Juszczak, 1995) but is largely unexplained. Our findings show that within the first 3 months after discharge, suicide risk is not uniform. It is at its maximum within the first 2 weeks after discharge and the greatest number of suicides occur

on the first post-discharge day. This pattern persists when patient-initiated discharges are excluded.

Possible explanations include: a return to the stressors of life outside hospital; return of insight resulting in awareness of the consequences of illness; reduced supervision, leading to failure to detect relapse; withdrawal from care through non-adherence and loss of contact. Overall, post-discharge suicide appears to fit the risk-protection model of suicide in which risk is a balance of risk factors and protective factors. In the post-discharge period, risk may be declining only slowly whereas the protective influence of in-patient care is fairly abruptly withdrawn. This is consistent with the finding that suicide in previously admitted patients in the community is associated with recent decreases in care (Appleby *et al*, 1999a).

If this is the explanation, suicide prevention may be more likely if intensive care is maintained and withdrawn only gradually following discharge to the community. This requires closer integration of in-patient and community mental health services and early follow-up for patients at risk. There is also a need for better access to acute services for patients in the early stages of relapse post-discharge. The findings also suggest that self-discharge by patients known to be at suicide risk should similarly be followed by more intensive after-care. Patients who discharge themselves are by definition difficult to engage but it is important for clinical services to offer early follow-up in this group and to avoid the 'malignant alienation' by which patients and staff give up on each other prior to patient suicide (Watts & Morgan, 1994).

ACKNOWLEDGEMENTS

The study was carried out as part of the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (Appleby *et al*, 1999b). The Inquiry was funded by the National Institute for Clinical Excellence and is currently funded by the National Patient Safety Agency. We acknowledge the help of district directors of public health, health authority and trust contacts and consultant psychiatrists in completing the questionnaires.

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CLINICAL IMPLICATIONS

- In-patient services should review the structure and layout of their wards and remove or cover all potential ligature points.
- In-patient services should review current practices with regard to non-routine observations and where necessary closely observe exits on open wards.
- Early follow-up in the community (within 7 days) should be provided after discharge for patients at risk, e.g. those with a history of severe mental illness or recent history of self-harm, and there should be assertive attempts to remain engaged with patients who discharge themselves.

LIMITATIONS

- No control data are available; firm aetiological conclusions cannot be drawn.
- Clinical and demographic information was obtained from retrospective examination of case notes and clinical judgements rather than standardised assessments.
- Clinicians providing information may have been biased by their awareness of the outcome.

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(First received 4 June 2004, final revision 8 February 2005, accepted 16 March 2005)

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