Observational cross sectional pilot study of adherence with antipsychotic medication in people with schizophrenia or schizoaffective disorders in prisons

Report to the NHS National R & D Programme on Forensic Mental Health

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The project and the team

This project formed part of the Prison Health Research Network and was commissioned by the NHS National R & D Programme on Forensic Mental Health as one of the four demonstration projects, run under the auspices of the Network. It brought together researchers from two participating Universities in the Network. Richard Gray (Institute of Psychiatry (IoP), King’s College, London and Judith Lathlean, School of Nursing and Midwifery (SoNaM), University of Southampton were the Co-Principal Investigators. Alice Mills (SoNaM) was the Research Fellow responsible for data collection and analysis in the two Southern England sites, assisted in data collection by Will Van Veenhuyzen, a senior registrar from Ravenswood Medium Secure Unit. Dan Bressington (formerly IoP, now Canterbury Christ Church University) was the Researcher in the London site. Dr Andrew Forrester (HMP Brixton) greatly facilitated access to respondents in one of the sites and Dr Luke Birmingham (University of Southampton) also provided advice on the project.
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Executive Summary

Background
Antipsychotic medication is an effective treatment for people with schizophrenia and schizoaffective disorder. Poor adherence with antipsychotic medication is a major preventable cause of increased symptoms and relapse, and can also result in re-hospitalisation, high economic costs, poor outcomes (Perkins, 2002), and in forensic settings, violent and disturbed behaviour. Estimates of non-adherence rates of patients with psychosis vary dramatically, ranging from 24 to 90%.

Similar rates of non-adherence with treatment are seen in prison environments and in the community, irrespective of the type of treatment being offered. The research literature on adherence amongst community populations has identified several factors that can influence adherence to antipsychotic medication, including substance misuse, medication side-effects, relationships with healthcare professionals and medication insight. However, no high quality empirical studies have examined adherence with antipsychotic medication in people with schizophrenia or schizoaffective disorder in prison, despite the high prevalence of psychosis among prisoners. This research was thus designed as a pilot study to explore adherence and satisfaction with antipsychotic medication among prisoners.

Aims
This pilot project has aimed to:
• Estimate the point prevalence of non-adherence to (typical/atypical) antipsychotic medication in population of people with schizophrenia or schizoaffective disorder in prison.

• Determine prisoners’ satisfaction with and beliefs and attitudes towards antipsychotic medication.

• Determine predictors of adherence in prisoners with schizophrenia or schizoaffective disorder.

• Compare the prevalence of adherence with a community sample of individuals with schizophrenia.

• Explore patients’ current and previous subjective experiences of medication (embedded qualitative element of project)

**Research design**

The research took place in three prisons (HMP Brixton (adult male local prison), HMP Winchester (adult male local and category C prison) and HMP Bronzefield (adult female local prison), which were chosen to ensure that a variety of prisoners could be included in the study. To be eligible to take part in the research, participants needed to have been in prison for at least a month, have been prescribed antipsychotic medication for at least four weeks and be aged over 18 years. Forty-four prisoners were included in the study.

An observational cross sectional survey design was used and data were collected through two main methods:
• Interviews with individual participants, which incorporated a range of self-report and interviewer-rated clinical measures to estimate the prevalence of adherence to antipsychotic medication and to determine prisoners’ satisfaction, beliefs and attitudes towards their medication, and a short qualitative interview section to explore participants’ past and current subjective experiences of medication.

• Analysis of case notes such as Inmate Medical Records (IMRs) to collect information about various potential predictors of adherence such as offence and prison characteristics, clinical diagnoses and previous psychiatric history.

Data from the clinical measures and case note analysis were analysed using SPSS to produce descriptive statistics and a final statistical model. Data from the qualitative interviews were analysed using simple qualitative content analysis.

Summary of main findings

Findings from the clinical measures and case note analysis

• The majority of prisoners were prescribed antipsychotic medication for the treatment of a psychotic disorder (n=38, 86%), with six participants (14%) being prescribed antipsychotic medication for personality disorder. Most prisoners were prescribed second generation antipsychotic medication (n=28, 64%).

• Results from the composite measure of adherence suggest that this population was passively accepting of medication, and that adherence rates were similar or slightly better than those seen in community samples of people with psychosis.

• The sample population had good insight and generally positive attitudes towards treatment. Scores for the Satisfaction with Antipsychotic Medication (SWAM)
scale suggest that this population was also generally satisfied with their medication.

- This population suffered more side effects than community samples of people with psychosis, despite being prescribed relatively modest levels of antipsychotics.

- Adherence was found to be correlated significantly and positively with global insight, acceptance of the need for treatment, treatment attitudes, treatment acceptability, and miscellaneous side effects.

- Adherence was significantly and negatively correlated with prisoners being in possession of their medication and medication insight on the SWAM scale.

- Participants taking antipsychotic medication orally were significantly more adherent than those who were administered their medication via a long acting depot.

- A stepwise linear regression analysis demonstrated that treatment acceptability and miscellaneous side effects were the only significant contributors towards adherence. A second stepwise linear regression analysis showed that two of the SWAM items on the treatment acceptability subscale (‘I feel motivated to take my antipsychotic medication’ and ‘my antipsychotic medication makes me feel better’) and the side effect of putting on weight accounted for 52% of the variance.

Findings from the qualitative interviews

- Many participants mentioned the positive effects of their medication (easing
psychotic symptoms, reducing anxiety) which had motivated them to take it and would continue to do so in the future.

- Participants had mixed opinions about side effects. Just over a third felt that they had to tolerate them in order to reap the benefits of the medication. Other found them intensely distressing and this had influenced their willingness to comply with medication in the past.

- Several prisoners whose medication was administered by staff reported being prevented from taking their medication as they were elsewhere in the prison (e.g. collecting meals, attending appointments) when it was being distributed.

- Just over half of the participants reported previous non-compliance with their medication, particularly in the community before they came into prison. Some simply forgot or were careless about taking their medication, often because use of other substances took priority.

- The routine of prison life could be beneficial in promoting adherence, particularly for those individuals who led chaotic lifestyles outside.

- Prisons do not fall under the Mental Health Act 1983 and treatment cannot be forcibly administered. When participants did not want to take their medication, they often simply refused to do so. Few reported being offered incentives or threatened with punishment if they did not take their medication.

- Two-thirds of prisoners reported that no-one had ever explained their medication to them. Without this knowledge, patients may find it difficult to trust mental health professionals and may become suspicious of their motives.
• The majority of respondents felt that their relationships with mental health professionals were good as they felt professionals listened to and acknowledged their concerns.

• Where relationships were viewed negatively, prisoners felt that their psychiatrist did not share their understanding of their mental health problems, or thought that they did not have enough time with their psychiatrist or CPN.

• Suggestions for improvements to their care included more time with mental health staff and more psychological input to help them deal with the issues they felt had led them to be on medication in the first instance.

Discussion

• The clinical characteristics of the prisoners in this sample were similar to those in community samples of people with schizophrenia in terms of type of medication prescribed, symptoms (Gray et al. 2005), satisfaction (Rofail et al. 2005), and insight (Mutsata et al. 2006). However, prisoners in this sample had more positive attitudes towards treatment and reported more side effects than in community samples (Gray et al. 2004; Gray et al. 2005), although such side effects did not appear to affect adherence.

• Recognition of the need for treatment was correlated with adherence and interventions to enhance adherence are more likely to be effective if they focus on helping prisoners recognise this need, which may be assisted by strong, positive therapeutic relationships with healthcare professionals.
• Motivation to take medication and perceived treatment efficacy emerged as explanatory variables in the regression model, and this is supported by the qualitative data which suggest that many participants valued their medication for its positive effects on their mental health. At a clinical level it suggests that interventions to enhance adherence should focus on helping prisoners recognise the benefits of medication.

• ‘Putting on weight’ was also a significant explanatory variable for adherence amongst this sample. However, weight gain was not objectively assessed, and it may be the consequence of other factors such as the prison diet and lack of exercise rather than a medication side effect.

• The nature of the prison environment may have an influence on how adverse effects are perceived by prisoners as they may have a different impact on quality of life than treatment in the general population. The lack of meaningful activity and associated boredom may result in prisoners welcoming sedation as a side effect. Similarly, other side effects that would normally impact on functioning in the general population (e.g. weight gain) may not have such a marked effect in the prison population.

• One of the major limitations of this study, however, is possible bias in the recruitment of the sample. This was a convenience and not a representative, random sample, and consequently our adherence estimates in this population may be overly optimistic.
Conclusion

In our model adherence to antipsychotic medication was explained by the perceived efficacy of treatment, motivation to take medication and weight gain. Interventions to enhance adherence with treatment in prisons should aim to improve the prisoners’ perceptions of treatment efficacy and the need for treatment, establish a trusting collaborative working relationship with mental health professionals, minimise practical problems collecting medication, address long-term substance misuse and explore/manage side effects.
**Introduction**

The Office for National Statistics prison survey (Singleton et al, 1998) found that, in a representative sample of 3000 prisoners, 9 out of 10 displayed signs of mental health problems with 10% of men and 14% of women demonstrating signs of psychosis. Antipsychotic medication is an effective treatment for people with schizophrenia and schizoaffective disorder. Poor adherence with antipsychotic medication is a major preventable cause of increased symptoms and relapse.

Members of the project team had identified adherence to medication as a possible problem with prisoners. However, following a review of the literature in 2005 using the key words: adherence or compliance or concordance; schizophrenia or schizoaffective disorder; antipsychotic or neuroleptic; medication; prison, no high quality empirical studies were found that had examined adherence with antipsychotic medication in people with schizophrenia or schizoaffective disorder in prison. Thus a pilot study was planned which formed part of the Network programme of demonstration projects.

It aimed to estimate the prevalence of non-adherence to antipsychotic medication in population of people with schizophrenia or schizoaffective disorder in prison; to determine prisoners’ satisfaction with and beliefs and attitudes towards such medication; to determine predictors of adherence amongst prisoners and explore prisoners’ current and previous subjective experiences of medication.
This report presents a review of the literature, the methodology and the research design for the study. The findings from the interviews in terms of the quantitative and qualitative elements are presented and the implications discussed. The way forward for further research is considered.
Literature review

Method

This literature review sought to establish the various factors associated with adherence/satisfaction with antipsychotic medication in prisoners. The review was conducted by searching; CINHAL, EMBASE, Medline and PsychINFO. Articles in English were included irrespective of country of origin. The search strategy included all aspects of influences on adherence and satisfaction with antipsychotic medication in prisoners. The terms used were: adherence, non-adherence, compliance, non compliance, concordance, satisfaction, schizophrenia, psychosis, treatment, antipsychotics, neuroleptic, medication, prisoners, offenders, prisons (used individually and in combination with Boolean operators; and/or).

Articles written since 1993 were included, the rationale for choosing 1993 is that this was when atypical antipsychotics became available and hence articles written after this time are more representative of the current clinical climate. Empirical studies published in peer reviewed journals were considered for relevance and inclusion in the review.

The results of the search revealed that the main body of evidence relates to influences on adherence and satisfaction with a range of medicines and antipsychotics in the general population. Literature exists that examines adherence in prisoners taking medicines other than antipsychotics. However, there were no empirical studies that investigated adherence with antipsychotics in prisons.
Introduction

Antipsychotic medication is an effective treatment for psychosis. However, large numbers of people stop taking medication in clinical practice. Not taking medicine places clients at higher risk of relapse than those whose continue taking treatment as prescribed; the one year relapse risk for adherent clients is about 20-30% whilst relapse rates without medication are around 70% (Johnson et al., 1983; Kissling & Leucht, 1999; Schooler, 1999).

In addition to relapse, stopping treatment with antipsychotics can result in re-hospitalisation, high economic costs and poor outcomes (Perkins, 2002). People with psychosis in forensic settings who stop taking medication are more likely to start behaving in a violent and disturbed manner. The incidences of violence can increase due to clients acting on delusional ideation or other psychotic experiences (Stubbs & Haw, 2001; Taylor, 1985; Link & Stueve, 1994).

The terminology used when exploring medication taking behaviour is an important concept as this may have an impact on how a client engages with professionals and perceives the relationship.

The term “compliance” has been used historically to describe medication taking behaviour and is sometimes used in studies designed to explore the reasons for not taking medication. “Compliance” suggests that a patient is a passive recipient of care who is expected to accept expert instructions from a clinician (Gasquet et al. 2006). This is often
viewed as a pejorative term by service users and research that predominantly looks at compliance tends to focus on understanding medication adherence from a professionals’ viewpoint. The term “adherence” also implies that a client has accepted advice to take medication; however this term also reflects the clients’ perspectives on taking medicines. “Concordance” has been used recently to describe the two-way process in deciding on and managing a treatment regimen. Concordance implies that the relationship between clinician and client is a partnership in which clients have the opportunity to express opinions and beliefs (Robson, 2002).

A service users’ satisfaction with antipsychotic treatment will heavily influence treatment adherence and higher levels of treatment satisfaction will improve prognosis (DOH, 1999). Despite the consensus that satisfaction is an important influence there is no agreed definition of treatment satisfaction. It has been proposed that satisfaction with treatment is determined by the collection of the clients’ subjective positive and negative experiences of treatment (Voruganti, 2002). Satisfaction is influenced by the tolerability and acceptability of treatment and relates to the attitudes that result from previous contact between client and clinician (Hellewell et al., 1999; Kane et al.; 1997). The published literature indicates that satisfaction with treatment is also a multi-factorial concept that is determined by acceptance of treatment/interventions (Jackson et al., 2001; Rofail et al., 2005; Gray et al., 2002).

The influences on adherence with treatment are complex and multi-factorial in nature. These influencing factors can be grouped under six main categories (WHO, 2003;
Kikkert et al. 2006; Puschner et al. 2006; Lambert et al. 2004; Fleischacker et al. 1994; Rofail et al. 2005; Mutsata et al. 2006; Lacro et al. 2002; Scott & Pope, 2002):

- Illness related factors (including insight and severity of psychotic symptoms).
- Treatment related factors (including side effects, efficacy and methods of administration).
- Clinician related factors (including a lack of collaborative working, authoritative attitudes, problems accessing clinicians and infrequent medication review).
- Patient related factors (including age, gender, beliefs about treatment and perceptions of illness severity).
- Environmental factors (including family beliefs about treatment and peer pressure).
- Cultural factors (patients’ ethnic background/culture).

**Mental health in prisons**

A review of literature about prison health care was carried out by Watson et al. (2004), who concluded that the aims of health care often conflict with the key tasks of the prison to punish and maintain order and control. Prison populations contain significantly higher levels of healthcare need than the general population due to the high prevalence not only of mental disorder, but also communicable diseases (Weild et al. 2000), chronic health conditions and behaviour likely to endanger health such as substance misuse (Fazel et al. 2006), smoking and risky sexual behaviour (Marshall et al. 2000).
A comprehensive survey of mental health in prisons in England and Wales by Singleton et al. (1998) found that only one prisoner in ten showed no signs of mental disorder. Ten percent of men on remand and 14% of all female prisoners had demonstrated signs of psychosis in the year prior to the interviews in comparison with 0.4% of the general population. Co-morbidity in prisoners was also found to be common, with seven out of ten prisoners having more than one disorder and prisoners with a diagnosis of psychosis likely to have three or more other disorders (Meltzer et al., 1994). Fazel and Danesh (2002) systematically reviewed 62 prisoner surveys from 12 different countries and confirmed the view that mental illness in prisoners is an increasing international problem not confined to the UK.

Suicide is a major risk in prisons and transferring prisoners to the health care centre does not guarantee safety; 14% of suicides in prisons occur here (Reed, 2003; HM Inspectorate of Prisons, 1999). Healthcare centres rarely provide adequate levels of support and stimulation (HM Chief Inspector of Prisons, 2004), often due to few opportunities to participate in constructive activities such as work or education (Mills, 2002). Explanations for suicide in prison are complex and varied. Liebling (1999) suggested that there are three distinct types of suicide; life-sentence prisoners, the psychiatrically ill and ‘poor copers’, who have difficulties coping with imprisonment and the pressures of prison life such as fear, boredom and isolation from family and friends. It is estimated that in around 22% of prison suicides the main motivation relates to mental illness rather than the pressures of living in prison or guilt about the offence (Reed, 2003; HM Inspectorate of Prisons, 1999).
The prevalence of mental illness in prisons is perceived to be increasing and this has been largely attributed to the introduction of care in the community policies and the subsequent closure of long stay community psychiatric hospitals. Transfers to the NHS of prisoners with serious mental illness are often delayed for months or years due to a shortage of beds and disputes over the necessary level of security, funding and the ‘treatability’ of the offender, resulting in an accumulation of prisoners with mental health needs (Isherwood & Parrott, 2002). The number of transfers from prison has recently risen to 779 in 2005, the highest level for a decade (Home Office, 2007), but this achievement should be seen in the context of a rapidly rising prison population. Prisoners who are awaiting transfer to NHS in-patient care are not detained under the Mental Health Act and can therefore only be given medication against their will under common law (Reed, 2003). A prisoner who is distressed and is refusing to take medication may have to wait long periods to be transferred to an NHS bed where the treatment can be enforced. The absence of legally enforced treatment in prisons may have an effect on adherence rates and how prisoners perceive treatment.

It is hypothesised that there may be differences in medication adherence between the general population and the prison population due to a range of factors including the absence of legal enforcement to take medication under the Mental Health Act and the potential differences in relationships between clinicians and patients in a prison environment. There is also a possibility that coercion to take medication may be apparent in prisons even without the right to insist on treatment under the Mental Health Act.
The desired and undesired effects of medication may also be viewed differently by prisoners than the general population, and it is possible that some side effects may be viewed as being beneficial in a prison environment.

*Measuring the prevalence of non-adherence*

By nature, research on adherence is complicated by measurement problems and the possibility that recruited subjects may be inherently more adherent than those subjects that refuse to participate. The measurement of adherence with treatment can prove difficult. Rates of adherence with treatment for individual patients are usually defined by a percentage of the prescribed medication dose actually taken, though this is notoriously difficult to ascertain. There have been many different approaches taken to measure adherence and these have been grouped by Osterburg & Blaschke (2005) into direct and indirect methods of measurement. Direct and indirect measures of adherence have both advantages and disadvantages. Examples of direct measures include direct observation and blood investigations, and indirect measures encompass patient self monitoring, pill counts, patient questionnaires and carer questionnaires. Due to the range of factors that can influence the outcomes of these measures it is suggested by Osterburg & Blaschke (2005) that a combination of measures should be used to enhance the accuracy of assessment.
Non-adherence in the general population

Reviews of literature on adherence with long-term therapies have highlighted the extent of non-adherence with a range of treatments in the general population (WHO, 2003). The average rate of adherence in clients with chronic conditions is 50% and varies slightly between disorders for example; 30-60% for antidepressants, 43% for asthma and 37-83% for HIV medicines (Demyttenaere & Haddad, 2000; Reid et al. 2000; Markowitz, 2000; Stein et al. 2000).

The World Health Organisation report on adherence concluded that non-adherence to long term treatment is a world wide problem. The report identifies four interacting determinants of adherence. The relationship with professionals and other service related factors are seen as being crucial. Condition related factors, patient related factors and treatment characteristics were also highlighted as determining adherence to treatment (WHO, 2003).

Non-adherence in prisons

The prevalence of non-adherence with treatment in prisons should be distinguished from non-adherence in the general population, due to the variations seen in treatment provision and clinical environments. However the evidence in this area is lacking.

A US study by Farabee et al. (2004) set out to establish antipsychotic adherence rates in people with mental health problems who were released from prison on parole. They found that 70.7% of parolees tested positive for the antipsychotic drug they were
prescribed. These results should be treated with caution when trying to generalise to the UK prison population due to coercion, as the research subjects were released from prison on condition that they attended outpatient clinics and accepted treatment. The adherence rate of 70.7% relates only to the presence of antipsychotic in the blood and it is therefore not possible to ascertain how much and for how long the prescribed treatment was actually taken.

Several studies have examined treatment adherence in prisons, but adherence to antipsychotics in prisons has not been extensively investigated. Baillargeon et al (2000) assessed correlates of antidepressant medication adherence in over 5000 prisoners in Texas. They used a 50% adherence rate to distinguish between compliant and non-compliant prisoners and observed prisoners whilst taking medication. The study indicates that, over a six month period, adherence to antidepressants (calculated as doses taken/doses prescribed) was estimated as 0.79, ranging between 0.74 - 0.86. These results also need to be treated with caution due to the potential limitations of the data collection; although the medication was directly administered on a dose-by-dose basis under the supervision of a prison officer there is no guarantee that medication put in the mouth was actually swallowed.

Duncan and Rogers (1998) used nurse ratings of compliance to assess treatment adherence rates in forensic outpatients. Ninety patients within the services were independently assessed to determine adherence rates; the patients involved had a variety
of diagnoses with the most common being schizophrenia (47.2%). Of the 90 patients, 40 were deemed compliant, 38 non-compliant and 12 partially compliant.

Soto Blanco et al. (2005) examined adherence to HIV medicines in three Spanish prisons using a cross-sectional survey design. A non-adherence prevalence rate of 54.8% was established. The prevalence of non-adherence in prisons appears to generally reflect rates seen across all disease areas in the general population.

**Non-adherence with antipsychotics in the general population**

Estimates of non-adherence rates of patients with psychosis vary dramatically ranging from 24 to 90%. Nose et al (2003) presented findings from a systematic review to provide an overall estimate of treatment non-adherence in community psychiatric services. A total of 103 studies were included and the overall mean rate of non-adherence in a community setting (in a sample of 23,796 patients) was 25.78 %. Studies of typical antipsychotics have shown that around 40% of patients discontinue medication within one year and this rises to around 75% after two years (Perkins, 1999). Other studies calculate a higher non-adherence rate of 70 -80% (Breen and Thornhill, 1998).

The wide differences in estimates of adherence rates are also seen in people taking other types of medication. Cramer and Rosenheck’s (1998) meta-analysis determined adherence rates of 76% (range 60 -92%) in people with physical illnesses and 63% (range 40 – 90%) in people taking antidepressants. The differences seen in estimates of non-adherence reflect the differences in methodological approaches of the studies and the
difficulties involved with accurately measuring adherence. Adherence with medication is not a static state and therefore most estimates represent point prevalence rather than adherence rates over time. Valenstein et al. (2006) retrospectively reviewed antipsychotic adherence rates of 34,128 patients over 4 years, and found that around 37% were poorly adherent in each year and that 61% of clients had problems with adherence over the 4-year period.

No studies were found that specifically investigated non-adherence with antipsychotics in prisons. Due to this the most meaningful data around influences on adherence with antipsychotics originate from the general population.

**Influences on adherence with antipsychotic medication in the general population**

Research exploring influences on adherence has historically focused on patient related factors. Predictors of adherence highlighted more recently have centred on service delivery and the nature/quality of relationships with professionals.

**Patient and family related influences on adherence**

Studies that investigate the influences on adherence relating to the client and family also have opposing results. Lacro et al. (2002) carried out an extensive review of literature to identify risk factors responsible for medication non-adherence in patients with schizophrenia. Several factors were identified, including poor insight, negative attitudes or subjective response towards medications, and previous non-adherence. In this review demographic influences were not associated with adherence. However other literature
suggests that demographic factors do have an influence on adherence. Valenstein et al. (2006) identified that in the USA patients who were younger and non-white were more likely to have consistently poor adherence over time.

In accordance with Lacro et al (2002), other studies (e.g. Razali et al. 1996) suggest that socio-demographic characteristics of patients were not consistently associated with differences in medication adherence. However, in other studies age has been found to have an impact on adherence behaviour (Razali et al. 1996; Agarwal et al. 1998; Dolder et al. 2003). Fleischhacker et al. (1994) reported that older adults were more likely to be non-adherent.

Similarly opposing findings relating to the effects of duration of illness on adherence are also seen; Lacro et al. (2002) and Agarwal et al. (1998) identified that a shorter duration of illness is likely to be associated with non-adherence. However, Scott & Pope (2002) argued that longer drug treatment is associated with a greater risk of non-adherence.

The nature and severity of patients’ psychopathology, such as suspiciousness, hostility, disorganisation and cognitive deficits has been investigated in terms of an association with non-adherence. Fenton et al. (1997) identified that high levels of psychopathology (an overall high PANNS score) was predictive of non-adherence. A recent study of clients with a first episode of psychosis by Kampmann et al. (2002) identified a similar correlation. However, it is important to note that patients who had a high score for positive symptoms were more likely to be adherent than those with a low positive
symptom score. These contradictory findings could be due to the fact that patients who had initially severe positive symptoms were able to identify an improvement in these symptoms and hence had an enhanced perception of treatment efficacy.

Substance abuse is another factor that influences medication adherence in people with schizophrenia, since people who have co-morbid substance use find adherence more difficult to achieve (Bebbington, 1995; Lacro et al. 2002). The impact of substance use on adherence with treatment is also highlighted by Owen et al. (1996) who calculate an 8-fold increased risk of non-adherence associated with substance use.

The family members of clients appear to have an influence on whether medication is taken or not, especially where the client is directly cared for by the family member. (Razali & Yahya, 1995).

Quality of life (QOL) has been investigated in terms of the relationship between QOL and adherence. Puschener et al. (2006) analysed baseline data gathered from a multi-centre randomized controlled trial from 409 participants in four European sites. They suggested that no direct relation could be concluded between subjective perceptions of quality of life and adherence with treatment. However, an indirect link between QOL and adherence was demonstrated and direct relations between other variates and QOL was identified. It appears that psychopathology, level of functioning and experience of unwanted side effects mediate the relationship between QOL and adherence. The limitations of this study include: self-rating of adherence by clients, the fact that clients
recruited were mostly outpatients; other factors e.g. relapse and dose of medication were not included and may have influenced adherence.

**Medication/treatment related influences**

Service related factors involved in the prescribing of medicines can influence adherence with treatment. Studies have investigated the associations between dose regimens and compliance and found that adherence was inversely proportional to frequency of dose (Fleischhacker et al., 1994, Claxton et al., 2001).

Perceptions about medication side effects, not the side effects themselves, can create negative reactions in psychotic patients. In a study by Scott & Pope (2002), they argued that the fear of side effects may result in non-adherence rather than the actual side effects experienced. Thoughts about and experiences of side effects will influence how an individual perceives their prescribed treatment. Holzinger et al. (2002) interviewed 77 people who were prescribed Clozapine, and found that attitudes towards psychotropic drugs have an influence on patients' adherence with antipsychotic treatment.

Studies that examine the influence of side effects on adherence with treatment have opposing findings. These differences may be attributed to the changes in prescribing practice seen after the advent of atypical antipsychotics. A US study by Gianfrancesco et al (2006) examined data from the medical claim forms of over 7000 patients to try and establish whether treatment adherence was improved in people taking atypical antipsychotics in comparison to typical antipsychotics. The findings suggest that
adherence intensity was slightly improved in the atypical group, but the duration of treatment between the two groups was not statistically significant. A major weakness of this study is that it is a retrospective analysis of clients who are eligible for medical insurance. Therefore the severity of illness that the clients present with may not represent the severity of illness seen in state hospitals where patients are not in possession of insurance.

A similar study by Lambert et al (2004) assessed the past and current influence of side effects of typical antipsychotics on adherence with treatment. A total of 213 patients with a diagnosis of schizophrenia were recruited and the type/severity of side effects assessed and correlated to adherence. Patients presenting with any side effect were more likely to have a negative attitude towards treatment and were more doubtful about efficacy. A regression analysis indicated that non-adherence was mainly influenced by negative attitudes towards antipsychotics and the experience of past or present antipsychotic side effects.

Health professional related influences
A positive therapeutic relationship with health care professionals results in higher rates of treatment satisfaction and the client’s perception of treatment alliance is a strong predictor of adherence (Awad, 2004). Patients who trust health care professionals are able to be more honest when discussing treatment and seem to have a more positive view of treatment than those who have a poor level of collaboration (Fleischhacker et al. 1994).
Holzinger et al. (2002) and Bjoerkman et al. (1995) reinforce this viewpoint and demonstrate that mental health out-patients feel that a professionals’ empathetic qualities were of most importance in terms of positively influencing therapeutic relationships. Fenton et al (1997) concluded that if a client perceives that a professional is interested in his/her progress then adherence to treatment will increase. Adequate time provided for patients is another factor that could help build positive therapeutic relationships (Ricketts, 1996). Negative relationships can have a negative impact on medication adherence. Lacro et al. (2002) found that a poor therapeutic relationship reduces patients’ medication adherence.

A recent study by Kikkert et al (2006) used concept mapping (a qualitative and quantitative research method) to ascertain the views of people with psychosis about factors affecting adherence. The findings are consistent with other recent evidence and highlight that the most important influences on adherence from a clients’ perspective are: efficacy of treatment, support from informal and formal sources, ability to self manage side effects and insight.

It can be seen that a great deal of information exists that investigates the influences on taking antipsychotics in the general population. However, the difference in treatment settings makes the generalisibility of these results to prison environments dubious.
**Influences on treatment adherence in prisons**

A number of studies have investigated the influences on adherence in ex-prisoners released into the community. The findings of these studies are relevant to this review as similar issues may be seen in the same client group irrespective of whether they are actually in prison or not. Farabee and colleagues (Farabee et al. 2004; Farabee and Shen, 2004a) investigated patient and service related factors that influence antipsychotic medication taking behaviour in parolees. It was observed that patients who used cocaine were less likely to be adherent with treatment and more likely to re-offend than those who did not use cocaine. African American and younger patients were more likely to be non-adherent than older patients of different ethnic origins. In terms of service related factors, perceived coercion was not associated with enhanced adherence. However being prescribed an atypical antipsychotic and having a guardian in the community resulted in an almost 10-fold increase in the likelihood of the parolee being tested positive for their prescribed antipsychotic.

Adherence with treatment regimens in prisons has been explored to try and ascertain which factors have an influence on adherence rates. The research on influences on adherence in prison specific environments encompasses a wide range of medicines, with a significant amount of data around the use of medicines for HIV. White et al. (2006) assessed the health beliefs and attitudes of 65 prisoners in terms of adherence to HIV medicines. Multiple antiretroviral adherence measures were used to test the psychometric properties of the survey questionnaire piloted. The findings suggest that patients with positive attitudes about medicines were more adherent. In terms of reasons for missed
doses the most commonly cited factors were: running out of medicine (44%), being absent when medicine dispensed (38%), forgetting (33%), being asleep when medicine dispensed (33%) and nausea due to side effects (33%). The small sample size and the use of only one prison to recruit participants limits the ability to generalise these findings to HIV infected prisoners in other institutions.

The relationship between the patient and professionals has an important influence on adherence and satisfaction with treatment in HIV positive women prisoners. Mostashari et al (1998) conducted structured interviews with 102 HIV infected females in the USA and found that trust in medications, trust in the health care system and interpersonal relationships with professionals/peers were significantly associated with improved adherence.

The impact of antidepressant side effects on adherence in prisons has been explored. The differences in adherence rates between Tricyclic (TCA) and SSRI antidepressants in 5305 prisons inmates was investigated by Baillargeon et al. (2000), who found that although adherence rates to SSRIs were slightly higher than to TCAs, there was no statistical significance between the groups. These findings are at odds with findings by Katzelnick et al (1996) and Fairman et al (1998). It is hypothesised that the differences in results could be attributed to prisoners perceiving benefit in the sedation side effects associated with TCAs whilst in a prison environment.
The impact of attitudes towards treatment on adherence is a reoccurring theme in the prison specific literature. A US study (Williams et al., 1998) examining attitudes towards psychiatric medications in a sample of female adolescent prisoners found that almost one half of the 214 subjects were doubtful of the benefits of treatment. Prior illicit drug use was not found to influence attitudes. However past treatment with psychiatric medications was associated with an enhanced perception of efficacy and acceptance of treatment. The strongest predictor of bias against pharmacotherapy was the idea that “people should solve problems on their own, medicines are a crutch”.

In terms of attitudes towards treatment, similarities are seen between forensic environments and the general population. Jennings et al (2002) established a psycho-education group for forensic patients in a high security setting. The effect of the group on attitudes towards treatment was measured and it was concluded that the education had a positive impact on the patients’ perceptions of treatment, and that these findings were broadly consistent with similar studies in non-forensic settings.

**Summary**

The literature highlights the high prevalence of mental illness in prisons and the high prevalence of treatment non-adherence in the general population. Similar rates of non-adherence with treatment are seen in prison environments irrespective of the type of treatment being offered and despite the absence of enforced treatment under the Mental Health Act. Non-adherence with antipsychotics is associated with an increased risk of relapse and, in forensic settings, with an increased chance of violence.
There were no high quality empirical UK published studies that examined the influences on antipsychotic medication adherence in prisoners. However, there are studies published in the USA investigating the various aspects of adherence with treatment in the prison system. The US studies focus on a variety of medicines rather than solely antipsychotics and the generalisability of findings to the UK is questionable due to the different prison environments and structures.

Studies that explore influences on adherence with antipsychotics in the general population indicate that taking medication is a complex health behaviour affected by a range of factors including; side effects, perception of side effects, relationships with clinicians, attitudes/beliefs about treatment and co-morbid substance misuse. Many of the studies have opposing findings and fail to agree on the strongest predictors of adherence with treatment. Most of the published studies confirm that attitudes towards treatment have a significant impact on treatment adherence, and that the nature of relationship between client and professional will determine how treatment is perceived. Despite differences in clinical environments the prevalence of non-adherence and influences on adherence in prisons are broadly consistent with the general population.
Methodology

Research aims

This pilot project has aimed to:

1. Estimate the point prevalence of non-adherence to (typical/atypical) antipsychotic medication in population of people with schizophrenia or schizoaffective disorder in prison.
2. Determine prisoners’ satisfaction with and beliefs and attitudes towards antipsychotic medication.
3. Determine predictors of adherence in prisoners with schizophrenia or schizoaffective disorder.
4. Compare the prevalence of adherence with a community sample of individuals with schizophrenia.
5. Explore patients current and previous subjective experiences of medication (embedded qualitative element of project)

The design

An observational cross sectional survey design was used to investigate treatment adherence and satisfaction with antipsychotic medication. Cross sectional designs enable relationships between variables to be ascertained and comparisons to be made between subgroups (Fife-Schaw 1995), and thus provide a useful tool to identify potential predictors of adherence. Data were collected through two main methods: interviews with individual participants, which incorporated both quantitative clinical measures and a short qualitative interview, and an analysis of case notes such as Inmate Medical Records
(IMRs). Such mixed method approaches allow the strengths of both quantitative and qualitative methods to be utilised and enable both confirmatory and exploratory questions to be answered (Teddlie and Tashakkori 2003). In this study, the data from quantitative element were collected to confirm any relationships between adherence and various predictors of adherence, whilst the qualitative data facilitated the exploration of the nature of relationships between these variables.

**Research sites**

The research took place in three prisons which were chosen to ensure that a variety of prisoners could be included in the study. HMP Brixton is a category B local prison which serves the courts of Inner and South London and has capacity for approximately 800 adult male remand and sentenced prisoners. HMP Winchester is a category B adult male local prison serving the local courts of Hampshire and the Isle of Wight, with an additional category C resettlement unit for longer term sentenced prisoners. It has an operational capacity of about 700. HMP Bronzefield is a closed female local prison located in Middlesex, with an operational capacity of 450. It was opened in 2004 and is the only private prison for female prisoners in England and Wales.

**Access and relation to the National Evaluation of Prison Mental Health In-Reach Services**

Access to research participants at HMP Bronzefield and HMP Winchester was negotiated as part of a larger national programme of research which seeks to evaluate the effectiveness of the prison mental health in-reach programme. This is taking place in five
sites and is funded by the NHS National R & D Programme on Forensic Mental Health. The third phase of the programme utilised clinical diagnostic interviews to estimate the prevalence of severe and enduring mental illness amongst prisoners and to examine whether those with severe mental illness are being offered mental health in-reach services. It thus provided an ideal opportunity to conduct a parallel pilot study on a sample of prisoners identified as having psychotic disorders and examine their satisfaction and adherence with their medication.

To be eligible for the current study, participants needed to have been in prison for at least a month, have been prescribed antipsychotic medication for at least four weeks and be aged over 18 years. Patients with severe learning disability or organic brain disease or without the capacity to give written informed consent were excluded from the study. Ethical approval for the research was obtained from the Thames Valley multi-centre research ethics committee (MREC) and research governance approval was sought from the two NHS Trusts and one private sector company that provided mental health services to the three prisons. The fieldwork took place between July 2006 and April 2007. Written informed consent was obtained from each prisoner who agreed to participate in the study and the interviews were carried out by research workers trained in using the research instruments.

In practice, few participants were actually recruited through the mental health in-reach study as many of the prisoners identified as having a psychotic disorder were discharged or transferred within four weeks of reception into prison. Thus in all three prisons an
alternative recruitment strategy was used. Members of mental healthcare staff, such as consultant psychiatrists and in-reach team leaders, were asked to identify potential participants who fitted the study criteria. These prisoners were then approached by the researchers and asked if they would like to participate in the research. Fifty-eight prisoners were considered to be suitable to take part in the study, 14 of whom refused to participate, creating a response rate of 75.9 per cent. This method of purposive sampling introduces a risk of bias as the mental health professionals may have been reluctant to identify those who had unfavourable opinions of their medication. However, it was the only practical method available to access potential participants within the research time frame.

**Interviews**

Interviews with participants combined two approaches to data collection: the application of quantitative clinical measures and a short qualitative interview.

**Clinical measures**

Self-report and interviewer-rated clinical measures were employed in this study to estimate the prevalence of adherence to antipsychotic medication, determine prisoners’ satisfaction, beliefs and attitudes towards their medication and to examine any associations between adherence and these variables.

Measuring adherence is far from straightforward as definitions of adherence can vary widely. It may, for example, include total or partial omission, not taking the
recommended dose at the right time or complying with recommended medication taking behaviour but not agreeing with it. In this study, adherence to medication was measured using a composite measure of adherence, a seven-point scale which categorises medication taking behaviours from complete refusal (1) to active participation (7) (Kemp et al 1998). This has the advantage of including partial omission (for example, where patients are accepting only a minimum dose), but also notes whether a patient questions or accepts their need for treatment and takes responsibility for their treatment. It was supplemented by the self-report Medication Adherence Questionnaire (Morisky et al. 1986), which consists of four questions on forgetting medication, carelessness and stopping medication when feeling better or worse, with affirmative answers scoring 0 and negative responses scoring 1. With this measure, the lower the final score, the stronger the adherence to medication.

In order to measure respondents’ attitudes and beliefs towards antipsychotic medication, the Drug Attitude Inventory (DAI) (Hogan et al. 1983) was used. This is a fixed choice scale which consists of 30 statements, written in simple language, which respondents are asked to rate as true or false. Hogan et al. (1983) found that DAI ratings could accurately assign 89 per cent of a large outpatient sample into compliant and non-compliant groups, showing it to be therefore highly predictive of compliance.

To measure patient satisfaction with antipsychotic medication; a factor which previous research has suggested is a determinant of adherence (Pellegrin et al. 2001), the Satisfaction with Antipsychotic Medication Scale (SWAM) (Rofail et al. 2005) was used.
It consists of 24 statements split into two subscales known to be related to satisfaction with medication; treatment acceptability (Hellewell et al. 1999, Naber and Kaspar, 2000) and medication insight (Awad, 1999), which participants are asked to rate using a five point Likert scale from ‘strongly disagree’ to ‘strongly agree’. The SWAM scale shows good reliability (α coefficient = 0.92 for the treatment acceptability scale and 0.84 for medication insight). The total score of the SWAM scale had α coefficient = 0.91, which ranged from 0.92-0.90 when tested in a cohort of 315 people with schizophrenia.

Insight was measured using the self-report Insight Scale for Psychosis (Birchwood et al. 1994). This is made up of an eight item scale covering three widely accepted dimensions of insight: perceived need for treatment, awareness of illness and relabelling symptoms as pathological (Tait et al. 2003); the higher the total score, the greater the level of insight. It demonstrates strong psychometric properties and has been widely used in research.

The Liverpool University Neuroleptic Side Effects Rating Scale (LUNSERS) (Day et al. 1995) was utilised to indicate the extent of side effects experienced by patients on medication. This self-report measure consists of 51 symptoms, 41 of which cover psychological, neurological, autonomic, hormonal and miscellaneous side effects that were constructed by rephrasing items from the UKU adverse events measure (Lingjaerde et al. 1997). The remaining ten items are ‘red-herrings’, i.e. symptoms that are not known to be neuroleptic side effects, which are included to ascertain whether participants are reporting side effects accurately or describing a high level of general symptomatology. Participants are asked to indicate that they have experienced a side-effect on a 0-4 scale.
(‘not at all’, ‘very little’, ‘a little’, ‘quite a lot’, ‘very much’). The LUNSERS is easily understood by those using it (Walker & MacAulay 2005), and shows good test re-test reliability ($r=0.81$) and concurrent validity against the UKU ($r=0.83$) (Day et al. 1995). It has demonstrated that there is a significant but weak correlation between increasing doses of antipsychotic medication (measured in chlorpromazine equivalent) and the number and frequency of side effects measured using the LUNSERS ($r=0.31$; Day et al. 1995).

The Brief Psychiatric Rating Scale Expanded (BPRS- E) (Ventura et al. 1993) was employed to measure psychopathology. It measures four different dimensions: positive symptoms, negative symptoms, depression, anxiety and manic excitement/disorganisation, through 24 items which are rated by the interviewer on a seven point ordered category rating scale ranging from ‘not present’ to ‘severe’. Ten items are rated on the basis of interviewer observation whilst the others are based primarily on verbal reports from patients. It takes on average about 20 minutes to complete and is thus a highly efficient way of describing and evaluating of major symptom characteristics (Overall and Gorham 1962).

Finally, to gather simple demographic data from participants such as age, ethnicity and history of previous contact with psychiatric services, a simple structured interview schedule initially created for the larger in-reach study was used.

Structured measures provide a time efficient way to identify levels of adherence and satisfaction, and facilitate the comparison of responses across different groups of
individuals (Barker et al. 2002). Most of the measures used in the study rely on self-reports from participants, which have been found to be more reliable than predictions from healthcare providers (Stephenson et al. 1993), but it has been suggested that patients tend to overestimate their compliance with neuroleptics (Kamili et al. 2001). They may be open to ‘social desirability bias’, whereby socially desirable behaviour or views are over-reported (Sudman & Bradburn, 1982), as participants rate statements according to what they think the researcher wants to hear. In this study, they may have been less willing to reveal attitudes which questioned their need for antipsychotic medication or the authority of mental health professionals for fear of disappointing their clinicians or of possible sanctions, despite assurances of confidentiality. The relationship between the interviewer and the participant may also affect the accuracy of self-report measures. If assessors have an empathetic, non-judgmental attitude and patients feel that they can trust them, they are more likely to feel able to report less socially desirable answers. In order to try and overcome any potential bias, the composite measures of adherence were included towards the end of the interview to allow for the development of rapport between the interviewer and interviewee to try and overcome any apprehension felt by the interviewee. Using a range of different measures within the same interview also provided an opportunity to test for consistency in reporting and information from self-reported measures was corroborated with discussions with mental health professionals and the case note analysis (see below).
Qualitative interview section

After the clinical measures had been administered, a brief qualitative interview was carried out. Qualitative interviews can provide access to the meanings that people attribute to their experiences and are likely to elicit data of greater depth and richer insight than more structured interviews (Miller and Glassner 1997). The qualitative part of the interview was used to illuminate the data from the clinical measures by exploring and elaborating upon significant factors which might affect satisfaction and predict adherence with antipsychotic medication. The interview questions were formulated in accordance with the aims of the research and included several issues that might affect adherence with medication such as views of antipsychotic medication, past experiences of non-adherence, medication avoidance, or relationships with healthcare professionals.

A semi-structured format was employed as this provides a highly flexible approach. Questions are specified but the interviewer seeks clarification and elaboration of the answers given and participants are able to raise issues of importance to them which may not be listed on the interview schedule. The semi-structured format also allows a degree of comparability between responses (May 2001). This section of the interview lasted between ten and 20 minutes and, with participants’ consent, it was digitally audio-recorded. Where this consent was not given, comprehensive notes were taken which were written up immediately after the interview. All audio-recorded interviews were transcribed verbatim with participants’ names or any other personal details removed to ensure anonymity.
Case note analysis

Case notes including Inmate Medical Record (IMRs), mental health in-reach records and general prisoner records, were analysed to collect information about various potential predictors of adherence such as offence and prison characteristics, clinical diagnoses, previous psychiatric hospital admissions, medication administration and prescribing, and number of behavioural disturbances. To aid the collection and analysis of these data, a simple proforma was devised which was filled in for each patient. Although these records were available for every participant, as in other prison research studies such as Birmingham et al. (2006), IMRs were found to be an unreliable source of information as they frequently did not document the diagnosis given or full and accurate details of the medication that the participant was receiving, which were often only found in mental health in-reach records.

Analysis

Data from the quantitative measures were analysed using SPSS v13.0. Data were initially described using descriptive statistics. Demographic, prison and clinical characteristics and total and sub-scale scores for each of the measures (independent variables) were then correlated – using either spearmans rho or Pearson’s product - with the dependent variable medication adherence. Independent variables that were significantly correlated with the dependent variable were then entered into stepwise liner regression to produce a final statistical model.
The data emerging from the qualitative interview section were analysed using simple qualitative content analysis. A list of themes emerging from the research questions, interview categories and the data themselves was compiled and the data were then coded according to these themes. They were then organised using Tesch’s (1990) method of ‘de-contextualising’ and ‘re-contextualising’, which helps to condense and expand data through new organising principles. In this process, data are divided up into coded segments, containing one idea or piece of information. Such segments are then extracted from their original context and are re-contextualised by being placed in the context of the topic or theme that they are related to. The re-contextualised data were then analysed to explore relationships, patterns and connections between categories or between data segments coded in the same category, and also to find instances where the qualitative data illuminates the meaning behind the findings from the quantitative data.
Findings

Demographic characteristics of the group

The 44 prisoners in the study had a mean age of 37 years (sd=8.99; range 19-61). The majority of the sample were male (n=36, 82%). Over half of the participants classified their ethnic background as being white (n=27, 61.4%). The remaining participants classified themselves as being black Caribbean (n=6, 13.6%), Asian (n=6, 13.6%), other (n=3; 6.8%) or black African (n=2; 4.5%). The majority of prisoners did not have academic qualifications above the GCSE/O’level standard (n=33, 75%).

Prison and offence related characteristics of the group

The median number of previous convictions was five (mean 11.49, sd 18.75, range 0-90) and imprisonments three (mean 3.85, sd=4.30 range 0-20). The mean number of years spent in prison (both on remand and convicted) was four (median 2.5, sd 5.01, range 0.1-23.5). On average people who participated in this study had been involved in behavioural or violent disturbances on two occasions in the previous month (mean 1.78, median 2, s.d. 0.42, range 1-2).

Clinical characteristics of the group

All patients that took part in this study were prescribed antipsychotic medication. The majority of prisoners were prescribed antipsychotic medication for the treatment of a psychotic disorder (n=38, 86%). Six participants (14%) were prescribed antipsychotic medication for personality disorder. On average prisoners had been mentally ill for 10 (s.d.=7.51) years and had been in contact with mental health services for a similar amount
of time (mean 9.66 years, s.d.=7.05). Most of the prisoners in the sample had had a past inpatient psychiatric admission (n=32, 73%). The mean number of psychiatric admissions was 4.23 (s.d.=6.55).

All prisoners who took part in the study had an identified mental health key worker and the majority (n=33, 75%) attended regular (at least once a month) appointments with them. The majority of prisoners had a history of non-attendance at mental health appointments (n=24, 62%). Most prisoners were prescribed second generation antipsychotic medication (n=28, 64% (risperidone n=6, 14%; olanzapine n=14, 32%; quetiapine n=4, 9%; aripiprazole n=3, 7%; or amisulpiride n=1, 2%)) and a third (n=13, 30%) were prescribed first generation antipsychotic medication (e.g. chlorpromazine/haloperidol). Three patients (7%) were co-prescribed first and second generation antipsychotic medication. On average patients were prescribed 56% of the recommended maximum dose of antipsychotic medication (sd=.039, range 3%-125%). Oral administration was the most frequently used method of taking antipsychotic medication. Twelve (27%) prisoners were given medication as a long acting depot injection. The median duration of treatment with the current antipsychotic drug was one year (mean 3.06, sd 5.12, range .08-30). Few patients were prescribed anticholinergic (to treat movement disorders) (n=10, 23%) or antidepressant medication (n=5, 11%). Most patients were not in possession of their own medication (n=34, 77%).

Table 1 shows the mean scores for adherence, treatment attitude, symptoms, satisfaction, side effects, insight and insight domains for the prisoners who participated in the study.
Table 1. Adherence, attitude, symptoms, satisfaction, side effects and insight scores in the study population

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medication adherence</strong></td>
<td></td>
</tr>
<tr>
<td>Composite measure (1-7 scale, 7=active participation)</td>
<td>5.09 (1.63)</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td></td>
</tr>
<tr>
<td>BPRS-total</td>
<td>49.29 (14.78)</td>
</tr>
<tr>
<td><strong>Insight</strong></td>
<td></td>
</tr>
<tr>
<td>ISP-Total (0-12, 12=good insight)</td>
<td>8.27 (3.22)</td>
</tr>
<tr>
<td>ISP-Relabel subscale (0-4, 4=good insight)</td>
<td>2.69 (1.15)</td>
</tr>
<tr>
<td>ISP-Awareness of illness subscale (0-4, 4=good insight)</td>
<td>2.64 (1.51)</td>
</tr>
<tr>
<td>ISP-Need for treatment subscale (0-4, 4=good insight)</td>
<td>2.94 (1.25)</td>
</tr>
<tr>
<td><strong>Treatment attitudes</strong></td>
<td></td>
</tr>
<tr>
<td>Hogan Drug Attitude Inventory (-30 to +30, +30=positive treatment attitudes)</td>
<td>10.79 (14.31)</td>
</tr>
<tr>
<td><strong>Satisfaction with Medication (SWAM)</strong></td>
<td></td>
</tr>
<tr>
<td>Treatment acceptability (15-75, high score=satisfaction)</td>
<td>50.90 (13.69)</td>
</tr>
<tr>
<td>Medication insight (45-9, low score=satisfaction)</td>
<td>22.06 (7.07)</td>
</tr>
<tr>
<td><strong>Medication side effects</strong></td>
<td></td>
</tr>
<tr>
<td>LUNSERS-total score (41-195)</td>
<td>78.23 (21.12)</td>
</tr>
<tr>
<td>Extrapyramidal side effects (6-30)</td>
<td>14.23 (5.74)</td>
</tr>
<tr>
<td>Anticholinergic side effects (5-25)</td>
<td>9.81 (4.25)</td>
</tr>
<tr>
<td>Side Effect</td>
<td>Score (SD)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Other autonomic side effects (5-25)</td>
<td>7.29 (2.42)</td>
</tr>
<tr>
<td>Allergic reactions (4-20)</td>
<td>6.31 (3.12)</td>
</tr>
<tr>
<td>Psychic side effects (10-50)</td>
<td>23.25 (7.74)</td>
</tr>
<tr>
<td>Hormonal side effects (6-30)</td>
<td>6.79 (2.41)</td>
</tr>
<tr>
<td>Period problems (2-10) (women only n=8)</td>
<td>2.25 (.71)</td>
</tr>
<tr>
<td>Miscellaneous (4-20)</td>
<td>8.16 (2.67)</td>
</tr>
<tr>
<td>Red herrings (10-50)</td>
<td>13.82 (3.94)</td>
</tr>
</tbody>
</table>

For the dependent variable (adherence) measured using the composite measure of compliance, nine prisoners rated the maximum score (active participation). Figure 1 shows the distribution of adherence scores that are slightly to the right of a normal distribution. The mean score for this population is similar or slightly better than that seen in community samples of people with psychosis (Gray et al 2004; Gray et al 2006) and suggests that the population is passively accepting of medication.
The BPRS total score suggests that moderate levels of psychotic symptoms are present in this population. Scores are slightly higher than those seen in community samples (Gray et al 2006) perhaps suggesting that there is either more severe or more poorly managed illness in the prison population. The positive mean total and sub-scale scores for the Insight scale suggest that the population has good insight and scores for the Drug Attitude Inventory are indicative of a generally positive attitude towards treatment. Scores for the two SWAM sub-scales – treatment acceptability and medication insight – suggest that this population was generally satisfied with antipsychotic medication.
The LUNSERS total score is higher than that seen in community samples of people with psychosis (Gray et al 2004). Scores are particularly high for psychic side effects that include three items that relate to sleep and extrapyramidal side effects (i.e. movement disorders).

**Correlates with medication adherence**

Adherence correlated significantly and positively with need for treatment insight sub-scale \( (r=0.48, p<0.001) \), insight total score \( (r=0.38, p=0.013) \), treatment attitudes \( (r=0.58, p<0.001) \), SWAM treatment acceptability sub-scale \( (r=0.62, p=<0.001) \), and LUNSERS miscellaneous sub-scale \( (r=0.33, p=0.029) \). Adherence was significantly and negatively correlated with prisoners being in possession of their medication (Pearson correlation= -.38, \( p=0.012 \)) and SWAM medication insight \( (r= -0.54, p<.001) \). No other demographic, prison or clinical factors correlated with adherence. Participants taking antipsychotic medication orally were significantly more adherent than those who were administered their medication via a long acting depot (tablet=5.45 vs. depot=4.17, \( t=2.45, p=0.019 \)). In prisoners taking antipsychotic medication, better adherence was associated with a past history of attending hospital appointments, a recognition of the need for treatment and positive medication insight, insight into the illness, positive drug attitudes, finding treatment acceptable, a lack of miscellaneous side effects (e.g. putting on weight) and having medication administered orally. Identifying correlates of medication adherence is helpful but limited, and regression modeling techniques were therefore utilised to identify factors that predict adherence.
A stepwise linear regression analysis was performed with the independent variables (possession of medication, history of clinic non-attendance, insight, acceptance of the need for treatment, treatment attitudes, SWAM medication insight, SWAM treatment acceptability and LUNSERS miscellaneous) that were correlated with the dependent variable (adherence). SWAM treatment acceptability and the LUNSERS miscellaneous subscale emerged as the only significant contributors towards adherence and accounted for 55% of the variance (adjusted $R^2=.55$, $F=8.44$, $p=.007$). Table 2 shows the details of the beta coefficients for each contributing variable.

**Table 2. Results of the model of fit for explanatory variables of adherence**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Explanatory variables</th>
<th>Standardised-coefficient</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence</td>
<td>SWAM treatment acceptability</td>
<td>.70</td>
<td>5.70</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>LUNSER miscellaneous</td>
<td>.36</td>
<td>2.91</td>
<td>.007</td>
</tr>
</tbody>
</table>

*Secondary analysis*

A secondary analysis was undertaken to explore which items of the SWAM treatment acceptability and LUNSERS miscellaneous sub-scales were correlated with adherence. Adherence was positively and significantly correlated with putting on weight (pearsons correlation=.49, $p<.001$) but with none of the other miscellaneous items (headaches, losing weight and pins and needles). Fourteen of the fifteen items from of the SWAM treatment acceptability sub-scale were positively and significantly correlated with adherence:
• I am involved in treatment decision (pearsons correlation = .45, p = .004)
• If someone said I have a mental illness, they would be correct (pearsons correlation = .36, p = .023)
• The consequences of not taking medication(s) are severe (pearsons correlation = .56, p < .001),
• My health professional (e.g. doctors/nurses) know best (pearsons correlation = .56, p < .001)
• Antipsychotic medication enables me to be independent (e.g. carry out everyday activities) (pearsons correlation = .54, p < .001)
• It is important to take my antipsychotic medication even when I feel better (pearsons correlation = .53, p < .001)
• My antipsychotic medication makes me feel better (pearsons correlation = .65, p < .001)
• Antipsychotic medication is helpful to me (pearsons correlation = .42, p = .007)
• I feel motivated to take my antipsychotic medication (pearsons correlation = .65, p < .001)
• I am satisfied with the way health professionals (doctors/nurses) have dealt with the side effects of my antipsychotic medication (pearsons correlation = .37, p = .019)
• I am satisfied with the outcome of my last discussion (pearsons correlation = .42, p < .019)
• Antipsychotic medication prevents future problems (pearsons correlation = .34, p = .031)
• I am satisfied with the way health professionals have dealt with the side effects of my antipsychotic medication (pearsons correlation =.47, p=.003).

The only SWAM-treatment acceptability item that was not correlated with adherence was ‘it is likely that the symptoms of my illness will persist’.

A second stepwise liner regression analysis was performed with the thirteen SWAM treatment acceptability items and the one LUNSERS item that were correlated with the dependent variable (adherence). Two of the SWAM items (I feel motivated to take my antipsychotic medication and my antipsychotic medication makes me feel better) and the LUNSERS item (putting on weight) accounted for 52% of the variance (adjusted $R^2=.52$, F=14.67, p<.001). Table 3 shows the details of the beta coefficients for each contributing variable.

Table 3. Results of the model of fit for explanatory variables of adherence

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Explanatory variables</th>
<th>Standardised-coefficient</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence</td>
<td>SWAM item – I feel motivated to take my antipsychotic medication</td>
<td>.32</td>
<td>2.11</td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td>SWAM item – my antipsychotic medication makes me feel better</td>
<td>.36</td>
<td>2.41</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>LUNSERS item – putting on weight</td>
<td>.27</td>
<td>2.23</td>
<td>.032</td>
</tr>
</tbody>
</table>
Adherence and satisfaction with medication

The quantitative data indicate that treatment acceptability is positively and significantly correlated with adherence, and motivation to take antipsychotic medication is a key explanatory variable of adherence. Responses given during the qualitative part of the interviews illustrate why this is the case as many participants mentioned the positive effects of their medication which had motivated them to take it and would continue to do so in the future:

Yeah. I’m glad I take it. Because I feel a better person for it. When I’m not taking it all I want to do is huddle up in the cell and not see people. I become very anti-social. (WC03)

When I started taking medication, yeah I felt like a new man. I was taking that olanzapine and I was getting on with it, I felt really positive, I felt level headed and the more I stopped taking it, just my whole world fell apart again. It takes time for them to kick in, but when I’m not on it I’m so depressed and distressed. (WC06)

Well at the moment, I’ve only just started Risperidone but I’m feeling the benefits already. The voices are a lot quieter. And they’re not so frequent. (BX02)

In some cases, these positive effects were not limited to easing psychotic symptoms, but the antipsychotic medication also calmed them down, made them feel less anxious and prevented self-harm:
Er…. Yeah. It just calms me down and gets me on a level. It stops me cutting up and my mood seems to lift… (BZ01)

‘Cos my thoughts are normally racing all the time and it’s slowed my thoughts down, but I’ve still got the clarity of thought. You know, it’s not numbed my head, it’s sort of, it’s just made me feel normal. (WC12)

When asked if they felt their medication was worth taking, some respondents felt that they needed to take it because of its capacity to prevent future problems:

I take my medication hoping that I’m going to get better because I want to get better. ... It does get frightening at times but I take it because I know I have to take it because I did once stop taking it and my world fell apart. (WC06)

These findings are consistent with those from Kikkert et al. (2006) who found that perceived treatment efficacy was the most important factor affecting medication adherence. Participants who reported a history of non-adherence recounted the negative consequences of this, ranging from self-harm to physical symptoms, which had strengthened their resolve to be adherent to their medication in future:

I disagreed with the medication that they were giving me. I was stupid, I was a fool to do that. I nearly lost my sanity. (WC01)
Whenever I don’t take it that’s when I have problems, and the reason I’m here is because I wasn’t taking my medicine at the time, at the time when I did what I did to have to come here. (BX07)

When you’re bonded with six or seven people, who actually know you and talk to you, they saw the difference come out of me when I didn’t have my tablets and they were quite concerned, they said to me ‘Fuckin hell, you need your tablets, mate’. Like straight away I’d get angry, straight away I’d get paranoid. I kept thinking they were talking about me and a whole aggressive side would come out of me which is not normal. (WC06)

Adherence and side effects

Research examining the side effects of antipsychotic mediation has produced inconclusive findings as to their direct influence on non-adherence (Scott & Pope 2002; Lambert 2004), and the qualitative data also revealed rather mixed opinions about side effects amongst the prisoners in our sample. Although they reported high scores on the LUNSERS scale, the impact of side effects on their attitudes to medication and adherence varied considerably. Just over a third felt that they had to just put up with the side effects and were prepared to do so in order to reap the benefits of the medication:

You know, there’s other medicines I’ve had in the past which have had that kind of side effect so it don’t really matter. It’s the good it does that’s really important. (WC12)

Well, I know it’s doing more good than it is harm so I don’t mind really. (BZ08)
Others found the side effects intensely distressing and this had influenced their willingness to comply with their medication in the past:

*I remember taking my first depot and it must have been about 250mg of Haloperidol or something, which is a lot and it absolutely knocked me out. I don’t remember anything for about a week after, all I remember is that I’d put on weight. I’d grown about six times my size, and I couldn’t even lift a dustpan and brush in that I didn’t have any movement in my arms, in my legs and my thoughts... I couldn’t do anything. I was like a zombie, it was really bad. That’s why I’ve been refusing to get medication ever since because I just don’t agree with what it does to you.* (BZ06)

*It makes me feel as though I wanna chuck it through the window, ‘cause my legs keep going up and down, up and down, and down.* (BX05)

**Adherence and administration of medication**

Although the statistical data indicate that those who self-administer their medication are less adherent with treatment than those who receive it from staff, several prisoners who did not hold their medication in possession reported that despite their desire to take their medication, they were sometimes prevented from doing so as they were elsewhere in the prison when it was being distributed. This led to them having to make choices about whether to engage in other activities such as drug treatment or stay on the wing to ensure that they did not miss their dose:
Because I’ve had appointments elsewhere, because I was on the detox, they only give it out at certain times so I actually missed it. (WC04)

It could also lead to them having to make choices about fetching their medication or their food:

First time I was on the house block and I got my dinner and then I had to have medication so I went to get medication, but then I wanted to have my dinner. So I missed the medication and went back for my dinner. That’s the lunchtime meds, but that’s because we have to go over to the main building. I’m always worried that I’m not going to have my dinner. (BZ03)

Not having medication in possession also meant that respondent did not have any choice when to take their medication, which could be a source of irritation:

(And when were you getting the Quetiapine?)

Morning and afternoon, even though I wanted it at night time. Not because it makes me feel sluggish tired but because I just know I will get a better night’s sleep if I take it at night time. (WC04)

Research examining adherence to HIV medication in prison has also suggested that doses could be missed due to absence from the area where the medication is dispensed or being asleep when medication is administered (White et al. 2006). Whether doses of staff-administered medication are omitted can vary according to where the prisoner is located. If prisoners are accommodated in the healthcare centre or another specialist setting and
medication is actually brought round to their cells, adherence is likely to be much more closely monitored by healthcare staff. If prisoners are required to collect their medication from a central pharmacy hatch, missed doses are more likely to occur and to go unnoticed. Prisoners also suggested that doses could be missed as it was sometimes too much trouble to go and collect their medication:

They call you for your medication, I will do my best to go and get it, but if there’s too much like people queuing up, I might just miss the, miss a dose. Just because of the aggro of it. It’s only a tablet for God’s sake, you know what I mean. (BZ04)

Whilst medication in possession is negatively correlated with adherence, staff administration does little to promote prisoners’ autonomy to allow them to actively engage in their own treatment decisions. Holding medication in possession may also help prisoners to get into the habit of taking it of their own accord and thus promote adherence in the community where it is unlikely to be administered on a daily basis.

**Adherence and the prison routine**

Just over half of the respondents who participated in the qualitative interview reported previous non-compliance with their medication, particularly in the community before they came into prison. A variety of different reasons were given for this non-adherence. Some participants simply forgot or were careless about taking their medication, often because use of other substances simply took priority:

Because I drink a lot, as I said earlier, I used to self-medicate with cannabis and alcohol and some other drugs in the past. The drink has usually been my number one priority. (WC04)
I forget because I take too much amphetamines on the out. (WC05)

Substance misuse has been recognised in the research literature as a factor which can substantially increase the likelihood of non-adherence (Bebbington, 1995; Lacro et al. 2002; Owen et al. 1996). Kamali et al. (2001), for example, found that comorbid substance misuse is significantly associated with poor compliance and can even prevent those patients with good insight from adhering to their medication.

Two respondents on depot injections blamed their non-adherence on the way their medication was administered:

It’s the actual having the injection. It’s the needle going into my bum, it’s just not right. I just don’t need it. It’s a hassle. The whole stigma of having to take the injection. (WC02)

It was getting, because to begin with my CPN used to come and give it to me, give me an injection at my house. But then they changed it and said that I had to go to the Bridge Centre. To get it. And it made it hard for me to get there because I didn’t like going out. (BZ08)

This may explain why those who take their medication orally were significantly more adherent than those who receive an intra-muscular injection and is consistent with the findings of previous studies which suggest that compliance with depot antipsychotic
regimens may be affected by factors which hinder attendance at depot clinics as well as the quality of the patient-professional relationship (Owen et al. 1996).

Other respondents did not take their medication because they felt they did not need to, either because they were in denial about their mental health problems or because they felt much better:

*A bit of denial and you know, ‘I haven’t got a problem’ sort of thing.* (WC08)

*I just didn’t want to spend the rest of my life on medication. So I guess I thought I was getting better so I decided to try and come off it.* (WC10)

One respondent was morally opposed to medication as she saw the symptoms of her illness, particularly the voices, as a special gift. Although she attended appointments to receive her depot, she made it clear that this was not because she agreed with the medication but because she was threatened with being sectioned if she did not:

*Yeah. I will take it to keep them happy, at the end of the day. To keep them off my back. I’d rather stay out of hospital than in. I’ve never been satisfied with it. I never will be. In the long term, if it’s keeping me out of hospital, psychiatric institutions, then yes I’ll continue to take it.* (BZ06)

Although prison and offence-related factors do not appear to be significantly correlated with adherence to antipsychotics among prisoners, when participants were asked if anything made it easier to take their medication, it became clear that the routine of prison
life could be beneficial, particularly for those individuals who led chaotic lifestyles outside. In prison, collecting or receiving their medication was as much a part of the routine as collecting their meals and this made it much easier to remember to take it:

*The fact that I’m in prison and it gets issued to me. And I’m told when it’s there. It makes it easier.* (BZ02)

*When I was outside I used to forget the medication. I used to, don’t care about time. But since I’ve been to the prison I start staying with the routine all the time. Now everyday when they give me my medication in my room, I take it on the time. I take it with the food; I don’t forget.* (BX01)

*Well, I think these spells in hospitals, where I more or less have a nurse or a doctor coming round saying “here’s your medication, take it” you know. Same in prison, you know.* (BX03)

For those patients with comorbid substance misuse, prison presented them with an opportunity not only to detox from these substances, but also to establish a healthier lifestyle and this may also explain why putting on weight is strongly associated with adherence in prison.

Beyond this, being in prison appeared to have little impact on adherence. Generally, respondents felt that prison or healthcare staff would only detect the consequences of them not taking their medication rather than noticing them not taking it in the first place.
Only a small number of prisoners, particularly those accommodated in healthcare or other specialist units were watched whilst taking their medication due to fears of overdose:

> When the girls have finished dishing the food out, the nurse’ll go behind with his trolley, and there’ll be an officer standing the other side, and they give you meds and the officer checks your mouth. (BZ02)

> I don’t, I take mine. I take it in front of the nurse. I swallow it down.

(And is that because they worry about you stashing tablets?)

> Yeah, I don’t do it now. They make me open my mouth, to open my mouth and show them. (BX08)

Prisons do not fall under the Mental Health Act 1983 and treatment cannot be forcibly administered. When participants did not want to take their medication, they often simply refused to do so:

> I just say I'm not taking it and that’s it. They try and talk you round but if I don’t want to take it, I won’t and that’s it (BZ05)

Only seven respondents felt that anyone would try and persuade them to take it, usually by talking to them and stressing the benefits of their medication, but in some cases, this included offering incentives:

> I think they’d offer me incentives like ‘we’ll lend you a kettle if you take your medicine’ or ‘come on, you’ll never get back to your own prison if you don’t take
your medicine’, so I think they’d used sort of social underhand measures to try and coax me. (WC03)

I get some bribes! I get bribed to take it sometimes! Some of the staff bribe me. ‘[name of participant] I’ll give you some cigarettes’, because I smoke tobacco in here, ‘I’ll give you proper cigarettes if you take your medication’ (BZ07)

This same prisoner also feared that she might also be coerced into taking her medication, not through physical force but by being threatened with being sent to the healthcare wing which suffered from a noticeably restricted regime:

They told me I’d go to healthcare which is like punishment because it’s ages bang up down there, yeah. They were like ‘we can make you take it’. And I was just like ‘oh stuff that then, I’ll take it over here’. They can make me go to healthcare. They can. (BZ07)

The inapplicability of the Mental Health Act in prisons therefore leaves prisoners able to decline their medication if they wish, although some prisoners may find themselves subject to subtler pressures to encourage them to take it.

**Medication insight**

Although the statistical analysis revealed a positive and significant correlation between adherence and insight and acceptance of the need for treatment, evidence for a relationship between insight and treatment adherence within the research literature is
inconclusive (Tait et al. 2003), and insight did not emerge as an explanatory variable in the regression analysis. Whilst many prisoners had insight into their need for treatment, few had much knowledge about the medication they were prescribed and its intended effects. Of those who took part in an audio recorded qualitative interview, two-thirds reported that no-one had ever explained to them what their medication should do or why they had been put on it. In cases where their medication was explained, participants had usually been told that their medication would reduce their psychotic symptoms, such as the voices they were hearing:

_They told me it’d ease up on the paranoia and create... normal thoughts rather than paranoid ones._ (WC09)

_All they said was that it can, it’ll help you with the voices. That was all I was ever told. They never told me anything else._ (BZ06)

Many mentioned their desire to know more about their medication and what it was doing to their bodies:

_Yes, obviously they have decreased my symptoms but I’d like to know sort of what sort of neurological parts it stops, what nerve endings it goes to, literally the ins and outs of the medication. Because I suffer with paranoia I do feel like a guinea pig sometimes with medication._ (WC04)

Without this knowledge, patients may find it difficult to trust mental health professionals and may become suspicious of their motives. In the community, patients can find out
more from the patient information leaflet enclosed with their medication. In the research prisons, these were only available to those who were allowed to keep their medication in possession. Since the fieldwork ended, one prison in the study has, however, made considerable efforts to let patients know that information sheets are available on request if they wish to see one. The efficacy of this measure may be limited by prisoners’ poor levels of literacy, making the need for verbal explanations from mental health professionals still necessary and an important aspect of the therapeutic relationship.

**Relationships with mental health professionals**

Previous research has suggested that a positive therapeutic alliance with healthcare professionals is a strong predictor of treatment satisfaction and adherence (Awad, 2004, Flesichhacker et al. 1994). Participants were thus asked how they would describe their relationship with their key healthcare professional, usually their psychiatrist. The majority of respondents felt that their relationships with mental health professionals were good and where this was the case, this was often because they felt professionals listened to and acknowledged their concerns:

> Well, I’ve got complete faith in him and he’s, I think he seems, the medication he’s put me on is a medication that will do me some good. Will help me and he’s been proved right. (WC12)

> Very good. He’s, you know, he’ll listen and at the relevant times he’ll you know say what he feels, what he thinks. (WC13)
Yeah, he’s that kind of guy that you could ask him anything if you wanted to and he’d answer. He’s like the older generation, you know, and you can talk to him easier, can’t you? They listen more. (BZ05)

He is good doctor. He understands me when I was talking to him about my worries about my frustration with the voices. And he didn’t send me out when I told him I’m experiencing some shaking, he put the lithium down. And I’m looking forward to seeing him again to tell him about it as well. (BX01)

Professionals’ empathetic qualities have been found to be the most important in terms of positively influencing therapeutic relationships and encouraging adherence (Fenton et al. 1997). Many who viewed their relationship with healthcare professionals as negative felt that their psychiatrist did not share their understanding of their mental health problems and of their medication:

Sometimes I feel that they view my problems in a different way to the way that I do. It might the correct way. I’m not sure. (WC01)

He don’t explain anything. He just sits down and talks about the past which is nothing to do with this medication. (WC11)

Well I disagree with Dr XX on the anti-psychotic drug. People being immune to it and it not working for them, I disagree with him on that. I think that if I was on the right one, it would work. (BX02)
Such relationships are likely to have a negative impact on medication adherence, particularly if patients do not understand why they have been put on certain medication or feel that their concerns are not being taken seriously. Adequate time for patients is another factor which can help to build positive therapeutic relationships (Ricketts 1996), and where respondents were not happy with the care received from mental health staff, this was often because they did not get to see their psychiatrist or CPN as much as they wished to:

*I’d say it’s good but the only trouble is I never have enough time with him. Enough time to talk things through because he’s very busy. So the consultations are always very short.* (WC03)

*He’s a bit useless! He just doesn’t seem to have the time for me really.* (BZ08)

Without the time and opportunity to listen to patients’ concern and explain their illness and the need for medication, the empathetic, therapeutic relationships which research suggests are important in encouraging adherence are unlikely to be formed. Due to the heavy prevalence of mental disorder within the prison population and the corresponding high demand for psychiatric services, time with mental health professionals is likely to be strictly limited despite the recent introduction of mental health in-reach teams.
Suggestions for improvement

All prisoners were asked how they felt their treatment whilst in prison could be improved. This question elicited mixed responses. Unsurprisingly, many wanted to see more of mental health staff:

*I’d like to see the psychiatrist more often. It’s taken two weeks to see a CPN but within three minutes of being inside this prison, I asked to see the psychiatrist straight away. (WC04)*

*Just medication and one to one with the psychiatrist. At the moment I only get to see him once a fortnight usually now. (WC05)*

Or they wanted medication that was more effective in tackling their symptoms:

*I know there’s loads of these different psychotic tablets that you can take. As [name of CPN] told me, maybe it takes time to find the right one. That’s what she said to me. Maybe I’m in the process of that, like trying to find the right one. This one has some effects that it works a bit, but unfortunately it doesn’t resolve the fact that I keep on seeing things, telly’s always talking to me and things like that. (WC06)*

Others mentioned the need for more psychological input to deal with the issues they felt had led them to be on the medication in the first instance:

*When I came from [name of prison], they said I need intensive psychology and basically when I came from the hospital to here, the hospital that [name of*
prison] had put me in, they didn’t have a psychologist they only had psychiatrists there. I got that stressed out one day I hung myself in the shower. And they couldn’t cope with that so they sent me here. And now that I’m here, the psychiatrist is saying they can’t treat me while I’m here, other than giving me medication. (WC10)

I don’t know. I think I need to talk through my problems rather than be on it, do you know what I mean? It’s just like hiding, covering up the feelings, do you know what I’m saying, in the short term? The feelings are still going to be there in the long term. (BZ07)

Well I think I should, need more counselling, you know, on a one to one basis, you know, as we’re having now, with a qualified counsellor, you know. I think that might help because I find the talking groups on a Thursday helpful you know. (BX03)

Unfortunately, psychological help in prisons is often unavailable or severely limited due to a lack of psychology staff on in-reach teams and the heavy demand for such services, and prisoners in only one of the research establishments had access to regular psychological support.
Discussion

In this sample of prisoners adherence scores suggested passive acceptance of treatment with antipsychotic medication, 20 per cent were actively participating in treatment decisions and taking some responsibility for treatment. Scores on the composite measure of adherence were comparable, and possibly slightly better than community samples of people with schizophrenia. This observation is consistent with studies that have examined medication adherence rates in prisoners with HIV and depression (Soto Blanco et al. 2005; Baillargeon et al. 2000).

One of the major limitations of this study, as with all studies that explore medication adherence, is possible bias in the recruitment of the sample. This was a convenience and not a random sample. Prisoners were invited to take part in the study and consequently a sample may have been recruited which was not representative of the population. Prisoners who were able to give written consent to participate may be more likely to take medication (and follow medical advice) with their medication and they may have been unwilling to reveal negative attitudes for fear of the repercussions (see methodology). Consequently our adherence estimates in this population may be overly optimistic.

Adherence and demographic factors

The demographic characteristics of participants are similar to those reported in studies of community samples of people with psychosis (Gray et al. 2004). In this study adherence was not correlated with any demographic factors (age, gender, ethnicity, academic attainment). There is limited evidence in the literature that shows associations between
certain demographic characteristics and adherence in community samples. For example, Valenstine et al. (2006) demonstrated that younger non-white patients were more likely to be non-adherent whilst Fleischacker et al. (1994) found that in their sample it was older patients who were more likely to take medication. Generally, however, there is little evidence of a clear association between demographic factors and medication adherence and the results of this study are consistent with this observation (Razali et al. 1996; Agarwal et al. 1998; Dolder et al. 2003).

Adherence and prison related factors

There was interest in whether prison related factors such as the number of years prisoners had spent incarcerated were related to medication adherence. However, as no correlation was found between any of the prison related factors measured and adherence, and as adherence rates in people taking antipsychotic drugs in prison and the community are similar, this implies that incarceration has no effect on whether people will take medication or on how actively involved they are in treatment decisions. Nevertheless, the qualitative data suggest that the prison routine may encourage adherence, particularly among those with substance misuse issues as it can encourage a more stable lifestyle if only temporarily. As the provisions of the Mental Health Act do not apply in prisons, treatment can not be enforced, but prisoners may be coerced into taking treatment by other means such as threatening to move them to an area of the prison with a more restricted regime, although the research suggests that this was a rare occurrence.
Adherence and clinical characteristics

Prisoners in this sample were all taking antipsychotic medication, the majority for the treatment of psychosis. The population had been ill, and in contact with mental health services, for around ten years and participants had had several admissions for psychiatric inpatient care. The clinical characteristics of the prisoners in this sample were similar to those in community samples of people with schizophrenia in terms of type of medication prescribed, symptoms (Gray et al. 2005), satisfaction (Rofail et al. 2005), and insight (Mutsata et al. 2006). However, prisoners in this sample had more positive attitudes towards treatment and higher scores on the LUNSERS side effect scale, suggesting they are experiencing these symptoms more frequently than in community samples, despite being prescribed relatively modest doses of antipsychotic medication (Gray et al. 2004; Gray et al. 2005), although such side effects did not appear to affect adherence.

In this study the duration of prisoners’ mental illness had no effect on their adherence with treatment. Agarwal et al. (1998) reported that a shorter duration of illness was associated with non-adherence. Scott and Pope (2002) found that the longer patients had been ill the less likely they were to take medication. Other authors have found, as we did, that duration of illness had no effect on adherence (Lacro et al. 2002). Medication adherence is a long term problem and there is insufficient evidence to suggest that interventions should be targeted at any particular point in a patients’ illness.

In prison medication is either given to prisoners on a weekly or fortnightly basis for self administration or is administered by prison staff. Prisoners who self administered were
found to be less adherent with treatment. Medication self administration has been promoted in psychiatric inpatient units to promote independence and enable patients to develop competence in taking medication in the community, and in prison, it may also ensure that prisoners are not forced to make choices between other therapeutic activities such as drug treatment or collecting food and their medication. It also promotes a sense of responsibility for their own health and autonomy by allowing prisoners to take their medication at a time which suits them, which may in itself encourage adherence.

An association was found between adherence and both global insight and acceptance for the need for treatment, one of the three sub-scales. This finding is consistent with authors who have reported a link between insight and adherence in people with psychosis (Kikkert et al. 2006). However, this link is not consistent in the literature and a number of authors have reported that insight is not associated with adherence (Puschner et al. 2006), and in the regression analysis it did not contribute to our final model. In prisoners it was found that it was the ‘need for treatment’ and not the ‘awareness of illness’ or ‘relabelling symptoms as pathological’ subscales that were correlated with adherence. This finding may be important as it suggests that interventions to enhance adherence are more likely to be effective if they focus on helping prisoners recognise the need for treatment. This also implies a need for a strong, positive therapeutic relationship with healthcare professionals to ensure that their medication is adequately explained to them.

In this study psychopathology was not correlated with adherence. This observation is inconsistent with Puschner et al. (2006) who reported a significant relationship between
the two in a community sample of people with schizophrenia. Kikkert et al. (2006) reported in a qualitative concept mapping study that perceived efficacy of treatment was the most important factor affecting medication adherence. Perceived treatment efficacy may be a component part of patients’ satisfaction with medication. Satisfaction is a complex concept that may be the aggregate of patients’ positive (such as perceived treatment efficacy) and negative (such as perceived medication side effects) subjective responses to medication (Voruganti, 2002). Both satisfaction subscales (treatment acceptability and medication insight) were correlated with adherence, and in the regression model, treatment acceptability was one of two variables that explained medication adherence. This may suggest that it is prisoners’ perception of treatment (measured using the SWAM treatment acceptability subscale) rather than objective improvements in their symptoms (measured using the BPRS) that explain medication adherence.

This hypothesis was explored further in a secondary analysis to examine which of the SWAM treatment acceptability items explained adherence. Most of the items in this subscale were correlated with adherence. However, in a stepwise regression analysis only two of them - ‘I feel motivated to take my antipsychotic medication’ and ‘my antipsychotic medication makes me feel better’ - significantly contributed to the final model. The analysis strengthens the hypothesis that it is prisoners’ perception of treatment efficacy that is important in influencing adherence and this is supported by the qualitative data which suggest that many participants valued their medication for its positive effects on their mental health. At a clinical level it may suggest that interventions
to enhance adherence should focus on helping prisoners recognise the benefits of medication.

In this study prisoner self report of the perceived frequency of side effects was not related to adherence for seven of the eight sub-scales of the LUNSERS. These findings are not consistent with Kikkert et al. (2006) and Lambert et al. (2004) who report that perceived side effects of medication were an important factor that negatively affected adherence in community samples of patients with schizophrenia. The evidence base about the effect of side effects on adherence is equivocal and authors have reported that side effects have minimal or no relationship with adherence (Puschner et al. 2006). The miscellaneous sub-scale of the LUNSERS was correlated with adherence. However, rather than being negatively correlated - that is to say the less frequent the side effect the more adherent the prisoner - the sub-scale was positively correlated. This observation suggests that the more frequent the patient perceived the side effect to be the more adherent they were, a finding that is at odds with the previous research. In a regression analysis this subscale was a significant part of our explanatory model. In a secondary analysis to determine which of the four LUNSERS miscellaneous items were related to adherence, only ‘putting on weight’ was correlated with adherence and in a second regression model this item was a significant explanatory variable. There are several possible explanations for this discrepant observation. First, this is a prison population and not a community population. Second, Kikkert et al. (2006), Lambert et al. (2004) and Puschner et al. (2006) did not examine the effect of individual side effects and it may be that some have a negative and others a positive effect on adherence. Finally, weight gain was not objectively assessed,
only prisoners’ perception of weight gain, and it is possible that if prisoners perceive that they are putting on weight they link this to taking an effective antipsychotic medication when it may be the consequence of other factors such as the prison diet and lack of exercise.

The nature of the prison environment may have an influence on how adverse effects are perceived by prisoners as they may have a different impact on quality of life than treatment in the general population. The lack of meaningful activity and associated boredom may result in prisoners welcoming sedation as a side effect. Similarly, other side effects that would normally impact on functioning in the general population (e.g. weight gain) may not have such a marked effect in the prison population.

Many studies have shown a link between medication adherence and attitudes towards treatment (Lacro et al. 2002). In this current study there was a clear relationship between treatment attitudes and medication adherence. However, attitudes were not significant in our regression model.

In the final regression model three variables explained 52% of the variance in adherence; ‘I feel motivated to take my medication’, ‘my medication makes me feel better’, and ‘putting on weight’. Other factors that we have not measured therefore have an important effect on adherence. One possible variable is substance use. In community populations substance use has been shown to be negatively associated with adherence (Lacro et al. 2002), and findings from the qualitative interviews suggest that substance misuse did
indeed affect adherence and that substance misusers were more adherent in prison as they
could no longer easily access illicit substances.
Conclusion

Medication adherence is important to enable recovery and prevent relapse. Medication adherence in prisoners’ prescribed antipsychotic medication is similar, and perhaps slightly better than that seen in community samples of people with psychosis. Nevertheless, only a minority of prisoners were autonomously taking responsibility for taking medication. In our model adherence was explained by the perceived efficacy of treatment, motivation to take medication and weight gain. Adherence may be enhanced in this population if the personal relevance of medication is increased. Interventions to enhance adherence with treatment in prisons should aim to improve the prisoners’ perceptions of treatment efficacy and the need for treatment, establish a trusting collaborative working relationship with mental health professionals, minimise practical problems collecting medication, address long-term substance misuse and explore/manage side effects.
References


