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Forensic Assertive Community Treatment in a Continuum of Care for Male Internees in Belgium: Results After 33 Months

Thomas Marquant^{1,2}  Bernard Sabbe¹ · Meike Van Nuffel² · Rudy Verelst³ · Kris Goethals⁴

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Abstract Non-forensic or regular assertive community treatment (ACT) has positive effects on non-forensic outcomes but has poor effects on forensic outcome measures. In this study, we examined non-forensic and forensic outcome measures of a forensic adaptation of ACT (ForACT) within a continuum of care for internees. Data were collected retrospectively from files of 70 participants in the ForACT group who had been released from a forensic hospital. The control group comprised internees who had left prison and entered community-based care (n= 56). The ForACT group demonstrated significantly better outcomes on forensic measures, such as arrests and incarcerations,

and had better community tenure. However, this group showed high hospitalization rates. The findings indicate that this type of community-based care can be beneficial for such internees; however, internees continue to experience difficulties reintegrating into society.

Keywords Forensic assertive community treatment · Community · Internees

Introduction

Non-forensic or regular assertive community treatment (ACT) is a well-researched method of caring for persons with severe mental illness in the community (Stein and Test 1980). Regular ACT has positive effects on non-forensic outcomes, such as number of hospital admissions or length of stay (Burns and Firn 2002; Crawford et al. 2004; Coldwell and Bender 2007; Marshall and Lockwood 2011). Burns (2011) identifies six aspects of regular ACT that are essential for these positive outcomes: the presence of embedded psychiatrists; coverage 24 h a day, 7 days a week; a relatively low caseload; an integrated substance use treatment offer; integrated vocational and social support; and a high rate of home visits (Burns 2011).

However, regular ACT has poor effects on forensic outcome measures, such as new arrests or incarcerations (Beach et al. 2013; Bond et al. 2001). This suggests a need for forensic adaptations of regular ACT (ForACT) that result in positive effects on both forensic and non-forensic outcome measures (Lamberti et al. 2004). One way of adapting ACT for patients that are referred for judicial actions (forensic patients) is to combine the main aspects of current forensic rehabilitation theories with the six elements described by Burns (2011). Currently, the main

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forensic rehabilitation theories are the risk need responsiveness model (Andrews and Bonta 2010) and the good lives model (Ward 2002). Both models emphasize that case managers should use a hybrid approach that combines treatment with structured risk assessment (Robertson et al. 2011). In addition, the communication between case managers and judicial partners should be a dialogue rather than a dialogue. Therefore, ForACT teams should maintain good communications with judicial partners (e.g., probation officers) and combine treatment with risk assessment.

A clinical team (ForACT) that combines the six elements identified by Burns (2011) and the two main aspects of forensic rehabilitation theories may produce positive effects on forensic and non-forensic outcome measures for forensic patients. The research literature suggests that some ForACT teams have adopted this combination, which increases the likelihood of positive effects on forensic outcome measures (Lamberti et al. 2004; Hayes 2014); overall, there is evidence for low arrest rates and very low incarceration rates (Cimino and Jennings 2002; Cusack et al. 2010; Parker 2004; Smith, 2010). Parker (2004) has reported good community tenure (CT) during follow-up of individuals who have been found not guilty because of insanity in a ForACT study. However, these studies show limited generalizability and substantial variation regarding inclusion and exclusion criteria, design, sample size, and duration of follow-up; in addition, most studies exclude high-risk patients, patients with a primary personality disorder, or violent offenders (Cimino and Jennings 2002; Cusack et al. 2010; Parker 2004; Solomon and Draine 1995). Standardized intake procedures are therefore needed (Lamberti et al. 2004). Previous studies have drawn on patients from a variety of settings, such as prisons, forensic hospitals, or mental health courts (Cusack et al. 2010; Smith et al. 2010).

We investigated a ForACT intervention embedded in a continuum of care for internees in Belgium. Participants were compared with internees who had left prison and entered different community-based care settings. In Belgium, patients deemed not guilty because of insanity are incarcerated and decisions on their rehabilitation trajectory are the responsibility of a specialized Commission for the Protection of Society (CPS). The CPS, which is advised by prison staff, is responsible for deciding whether the internee should be released to a forensic hospital or directly to community-based care. Patients then leave prison and go to a forensic hospital before being transferred to the ForACT project. A previous uncontrolled study by Smith et al. (2010) found promising results when ForACT was used within such a continuum of care.

The current study reports on forensic and non-forensic outcome measures and CT of patients 33 months after the start of a ForACT project in Belgium. We investigated whether patients in the ForACT team experienced

Table 1 Clinical and demographic Characteristics of the experimental and control group

Variable	ForACT (N = 70) N(SD)/%	Control group (N = 56) N(SD)/%
Clinical		
Antisocial personality traits	36/48.6	36/64
Substance use diagnosis	57/81.4	32/57
Demographic		
Age	39.5 (10.1)	39 (9.1)
Judicial		
History of violent offending	43/62	35/63
No history of violent offending	27/38	21/37

fewer arrests and incarcerations, fewer and shorter hospital admissions, and better CT than patients released into different types of community-based care.

Methods

Participants

Table 1 shows participants' baseline demographic and clinical characteristics at the start of the study period. The intervention group comprised all patients that were included in the ForACT project between April 1, 2012, and January 1, 2015. The project was located in Leuven, Belgium and was the only ForACT project in Belgium. The ForACT project was embedded in a continuum of care with a stepwise trajectory, divided into a residential stage and a ForACT stage. The residential stage of the continuum of care comprised two separate stages: a period in the closed ward, followed by a stay in the open ward. One section of the closed ward treated patients with a primary diagnosis of a personality disorder and the other section treated patients with a primary diagnosis of psychosis. Following their stay in the closed ward, all patients stayed in the same open ward. During the residential stage of the continuum, patients could at any time return to the closed wards if it was deemed necessary (e.g., if patients relapsed into substance use or became mentally instable).

Before admission to the residential stage, prison staff assessed patients mainly using the Historical-Clinical-Risk Management-20 (HCR-20, Webster et al. 2006) and assessed the primary diagnosis. Patients who were female, those who were deemed high risk, or those with a primary diagnosis of paraphilia or a learning disability were excluded from the residential stage and from the subsequent ForACT intervention. Patients who were included in the residential stage were only excluded from the ForACT

group if they chose to live outside the catchment area for the study.

Once referred to the ForACT intervention, patients underwent a standardized intake procedure comprising a structured interview and a short-term risk assessment using the Short Term Assessment of Risk and Treatability (Webster et al. 1997, 2006). This measure was chosen because it assesses short-term risk and can be used as a management tool, rather than just an assessment tool (Webster et al. 1997). Diagnoses were retrieved before the intake from the residential ward, using terminology from the Diagnostic and Statistical Manual, 4th edition (APA 2000). Once patients were included in the ForACT group, the main decision making was carried out by the ForACT team. Patients could at any time be readmitted into the open or closed wards of the residential stage of the continuum. The decision making regarding patients admitted to the wards was split between the ward staff and the ForACT team. In total, 70 patients were included over the study period.

The control group comprised all internees leaving Antwerp prison, Belgium, and entering community-based care between April 1, 2012, and January 1, 2015. We chose to use a prison in a different location from the intervention group to avoid transfers between the intervention and the control group. The community-based care experienced by the control group was different from the ForACT intervention. The same exclusion criteria were used for the control group and the prison staff assessed patients' risk using HCR-20 and assessed the primary diagnosis.

Recruitment Method

All referrals of the ForACT team were included in the intervention group ($n = 74$) between April 1, 2012, and January 1, 2015. Patients who entered the ForACT project from different settings (e.g., prison) were excluded ($n = 4$) as they did not experience the whole continuum of care. Therefore, 70 patients were included. For the control group, the Antwerp prison records were used to identify all internees released from prison between April 1, 2012, and January 1, 2015 ($n = 398$). Clients who went to settings other than community-based care were excluded ($n = 326$). Of patients leaving prison and entering community-based care, those with a primary diagnosis of a paraphilia ($n = 9$), a primary diagnosis of learning disability ($n = 7$), or those deemed high risk ($n = 0$) were excluded. In total, there were 56 patients in the control group.

Interventions

The ForACT project included all six aspects of care related to non-forensic outcomes as well as the two main aspects of current forensic rehabilitation, as discussed in the

introduction (Burns and Fim 2002; Robertson et al. 2011). The team was multidisciplinary and comprised a part-time team leader and two embedded psychiatrists, who participated in regular home visits. Home visits were the main way of meeting patients, but occasionally staff contacted patients by phone or met them in the ForACT headquarters. The team also included social workers and psychiatric nurses. In addition to these case managers, there was also a vocational specialist and an expert service user. The team coverage was 24 h a day, 7 days a week. A dual diagnosis treatment officer was integrated into the team and available for clients with comorbid substance use disorders (Drake et al. 2001). Patients in the ForACT group could either live in supported housing or rent privately. Management of supported housing was part of the ForACT team follow-up and conducted by the same case managers. Follow-up by the ForACT team was interrupted for those patients unable to adapt sufficiently to life in the community. Reasons for this were continuing, worsening substance use; continuing, insufficient coping with community-based living; or continuing risky behaviors (e.g., arrests). These patients were transferred to a long-stay ward in the forensic hospital and the ForACT staff were no longer involved in their care.

The control group did not receive care characterized by the six aspects of care related to non-forensic outcomes and the two main aspects of current forensic rehabilitation (Burns and Fim 2002; Robertson et al. 2011). Patients in the control group received a range of community-based care. Some only experienced follow-up by a psychiatrist; others experienced follow-up by a daycare center that offered multidisciplinary care or even supported housing. Further details of the control group's care are discussed in the section on variables below.

Outcome Variables

We used the six aspects of care related to non-forensic outcomes and the two main aspects of current forensic rehabilitation to compare the community-based care received by the control and intervention groups. We scored how many of the six aspects were included on a scale from 0 to 6 and recorded the presence of either of the latter two aspects. This enabled us to use these scores as measures of model fidelity. Information about model fidelity for the intervention group was assessed at intake; for the control group we gathered this information from prison files.

The main outcome variables were divided into forensic variables, non-forensic variables, and CT.

Data on forensic variables (arrests and incarcerations) were collected for both the intervention and control groups. Data for these variables were only retained if the incidents that led to the arrests or incarcerations occurred during follow-up by the ForACT team. Arrests were defined as

any incident leading to a police booking and subsequent prosecution. Bookings that did not lead to prosecution, and bookings regarding incidents that happened outside of the ForACT follow-up period, were not recorded as arrests. Incarcerations were defined as any new incident leading to a new incarceration in prison. The reason for the arrests and incarcerations was also recorded. Possible reasons for arrest depended on the charges brought against the patient, such as murder, manslaughter, assault, sexual offences, (violent or non-violent) theft, stalking, and substance use-related crime. Possible reasons for incarcerations were divided into arrests open to prosecution or a breach of conditions. Breached conditions included missed appointments and substance use.

For the intervention group, both forensic outcome measures were recorded retrospectively from the files of the ForACT team, checked after 33 months with the responsible probation officer, and double-checked 6 months after the study period in the files of the responsible CPS. This procedure was followed because some bookings take time to be communicated from the police station to the responsible probation officer or CPS. For the control group, data for both forensic outcome measures were collected retrospectively from the Antwerp CPS files 6 months after the study period. We also identified from the literature those patient characteristics most strongly related to arrests and incarcerations and used these characteristics as covariates in the statistical analysis. These variables were antisocial personality traits, a lifetime diagnosis of a substance use disorder, and previously violent offences (Andrews and Bonta 2010). These data were collected at intake for the intervention group and collected from prison files for the control group. Antisocial personality traits were defined as a primary or secondary diagnosis of an antisocial personality disorder.

The non-forensic variables were hospitalizations, length of hospitalized stay, and the reason for the hospitalization. For those patients who were transferred from the ForACT group to a long-stay ward after interruption of the follow-up, we recorded the reasons for the transfer. Information about hospitalization rates, reasons for hospitalization, and length of stay for the intervention group was gathered retrospectively from the files of the ForACT team and checked with hospital records. For the control group, information was gathered from prison files. Possible reasons for hospitalization included substance use (alcohol or drugs), mental instability, or antisocial behavior (e.g., aggression).

CT is a way of measuring how effective community-based care is in keeping people in the community (Parker 2004). CT is calculated as the potential number of days a patient spends in the community (potential CT) divided by the actual number of days a patient spends in the community (actual CT). Ideally, a patient would spend all of his or her days in the community, which would produce a

score of 100%. If the patient spends any days in detention or as an inpatient, the CT will drop below 100%. Previous research by Parker (2004) revealed a good CT of 80% in one ForACT project. Information on CT was gathered retrospectively from files for the intervention group and checked with the hospital records. For the control group, we used prison files and CPS files to record CT.

Statistical Methods

All statistics were conducted using SPSS, version 22 (IBM Corp., Armonk, NY). To examine differences in model fidelity between the intervention and control groups, we used a Mann–Whitney U test (Field 2013) to compare the number of aspects of regular ACT (0–6) and the main two aspects of forensic rehabilitation models (0–2). We needed to establish a difference in model fidelity between the groups to allow further analysis of between-group differences.

Both forensic outcome measures (arrests and incarcerations) were categorical variables. A patient was either rearrested/incarcerated or was not rearrested/incarcerated. There were no patients with more than one arrest or incarceration. Therefore, the odds of a patient being rearrested or incarcerated during follow-up in the intervention and the control groups were estimated using binary logistic regression. To examine differences between the intervention and control groups, we created the covariate “group” (control = 0; ForACT = 1) with the control group as the reference outcome. The clinical and demographic factors related in the literature to the outcome measures were used as categorical covariates. These consisted of antisocial personality traits, a lifetime diagnosis of a substance use disorder, and previously violent offences, as discussed previously (Andrews and Bonta 2010). For arrests, the model fitness was as follows: $R^2 = 0.07$ (Cox & Snell); $R^2 = 0.16$ (Nagelkerke); chi-squared model = 9.41 ($p = .05$). For incarcerations, the model fitness was as follows: $R^2 = 0.25$ (Cox & Snell); $R^2 = 0.35$ (Nagelkerke); chi-squared model = 35.34 ($p < .001$).

Hospitalization rates for the intervention and control groups were compared using a binary logistic regression. The model fitness was as follows: $R^2 = 0.325$ (Cox & Snell); $R^2 = 0.447$ (Nagelkerke); chi-squared model = 48.7 ($p < .01$). We used descriptive statistics to examine the length of stay and the reasons for hospital admissions. Possible reasons for admissions included substance use, non-substance use-related psychosis, or antisocial behavior (e.g., aggression, rule breaking). Descriptive statistics were also examined for other non-forensic outcome measures, such as interruption of follow-up and the reasons for this.

To compare CT in the control and intervention groups, we used binary logistic regression to determine the odds of

Table 2 Model fidelity

	For ACT (n/%)	Control (n/%)
Elements of general ACT		
Embedded psychiatrist	68/95.7	5/2.8
Low case load	70/100	2/3.5
Home-visits	70/100	2/3.5
24/7 coverage	70/100	3/5
Integrated SUD treatment	70/100	15/26.7
Integrated vocational treatment	70/100	18/33
Main forensic elements		
Hybrid functioning	70/100	2/4
Good communications with justice	70/100	18/33
Average		
Elements of general ACT	5.95	1.61
Main forensic elements	2	0.38

a patient being among those patients with a CT of 80% or higher, as 80% was the mean CT in the intervention group over the study period. The model fitness was as follows: $R^2 = 0.05$ (Cox & Snell); $R^2 = 0.064$ (Nagelkerke); chi-squared model = 6.07 ($p = .01$). To exclude any interference of significant differences in potential CT between the intervention and control groups, we performed a t test ($p > .05$; Levene's test: $F = 3.97$, $p = .05$).

Results

Model Fidelity

Table 2 shows an overview of model fidelity for the intervention and control groups. The Mann–Whitney U test indicated significant differences in model fidelity between the intervention and control groups. This finding was necessary to allow further analysis of the differences between both groups. Patients in the control group received a range of community-based care but did not receive care that adhered to the six basic elements of regular ACT or that contained the main aspects of forensic rehabilitation theories. Only 4% of patients in the control group received community-based care that used a hybrid approach, and only 33% received care that featured good communications with the probation officer. In contrast, 86% received care from a psychiatrist, yet only 10% of these psychiatrists were embedded in a multidisciplinary team. Home visits were only performed regularly in two cases. In the intervention group, three patients chose a psychiatrist who was not embedded in the ForACT team, reducing their model fidelity to five. All other patients in the ForACT group had a model fidelity of six and received care that included the two main aspects of forensic rehabilitation theories.

Table 3 Overview of the main outcome variables

(co)-Variable	b	Odds ratio	95% CI	
Forensic outcome measures: recidivism				
Antisocial personality traits	6.25	0.85	3.33	0.21
Substance use disorder	5.56	0.83	3.33	0.21
Violent index offence	1.08	0.39	1.47	0.11
Group	0.54	0.16*	0.83	0.03
Forensic outcome measures: new incarcerations				
Antisocial personality traits	0.59	1.18	2.97	0.47
Substance use disorder	1.14	0.24	6.85	0.89
Violent index offence	2.56	0.68	1.72	0.26
Group	0.38	0.07*	0.19	0.03
Non-Forensic outcome measures: hospitalizations				
Group	0.31	0.05*	0.17	0.01

$R^2 = 0.07$ (Cox & Snell) 0.162 (Nagelkerke). Model $\chi^2 = 9405$
 $R^2 = 0.248$ (Cox & Snell) $R^2 = 0.347$ (Nagelkerke). Model $\chi^2 = 35.341$

$R^2 = 0.325$ (Cox & Snell), $R^2 = 0.447$ (Nagelkerke); Model $\chi^2 = 48.7$

$p = .05$, * $p < .05$

$p = .001$, * $p < .01$

($p < .01$), * $p < .01$

Forensic Outcome Measures

Table 3 shows analysis results for the main forensic outcome measures, arrests and incarcerations. The probability of a new arrest in the ForACT group was over 6 times less likely than in the control group and this difference was significant (OR .16; 95% CI: .83, .03; $p = .03$). Overall, arrest rates were low for both groups. The arrest rate for the intervention group was 2.8% and for the control group was 16%, indicating that there were two arrests in the intervention group. One concerned a charge of stalking and the second involved non-violent theft. There were no arrests for violent incidents in the intervention group. In the control group, there were nine arrests, one of which involved a violent incident.

Patients in the ForACT group were 14 times less likely to be incarcerated during follow-up and this difference was significant (OR .07; 95% CI: .19, .03; $p < .003$). In contrast to this low arrest rate, the incarceration rate was as high as 58% in the control group, but only three patients were incarcerated during follow-up by the ForACT team (4.3%). One patient was incarcerated for absconding, one after charges of stalking, and a third after a breach of conditions. In the control group, the main reasons for incarcerations were a breach of conditions, followed by bookings (without prosecution), and new arrests. In most cases, breach of conditions concerned missed appointments (19%) and substance use (14%). The average number of detention

days was 513 for the control group; this suggests that once patients had returned to prison, they found it difficult to get released.

Non-forensic Outcome Measures

Table 3 shows the hospitalization rates of the intervention and control groups. Patients in the ForACT group were over 21 times more likely to have at least one hospital admission during the follow-up compared with patients in the control group (OR .05, 95% CI .17, .01; $p < .01$). The hospitalization rate for the ForACT group was very high (50%). A total of 103 admissions were recorded during follow-up and the average length of stay for the intervention group was 12.3 days ($SD = 21.98$; median = 7). Of these admissions, 70% were for substance use, mostly illegal substance use (58%) or alcohol use (12%). Other reasons for admission included non-substance use-related psychosis (12.7%) or antisocial behavior (6.8%). Only 17 patients (24%) were responsible for 68% of the total number of admissions ($n = 70$). There was an average of three admissions for this group, compared with 1.6 for the total group (range = 0–11). Substance use accounted for nearly all the admissions in this group. In the ForACT group, 50% of all patients had no admissions and 25% had a maximum of two admissions. The reasons for admissions for this group were much more diverse; substance use accounted for only 10% of admissions. The ForACT team interrupted follow-up of 12 patients (17%) because of continuing substance use; these patients were transferred to a long-stay unit.

In contrast, there were only three reported admissions for the control group over the whole study period, with an average length of stay of 2 days. There was limited information on reasons for admission; these were recorded as generalized mental instability that combined substance use and mental state deterioration.

Community Tenure

On average, the CT for the ForACT group was 80% compared with 64% for the control group. However, the odds of a patient in the ForACT group having a CT of 80% or higher were 2.5 times greater than for a patient in the control group, which was a significant difference (OR 2.5; 95% CI: 1.2, 5.22; $p < .05$). This indicates that the ForACT intervention was effective at helping participants remain in the community.

The reasons for reduced CT were different for the intervention and control groups. Nearly all curtailment of CT in the ForACT group was because of hospitalization days (77%); in contrast, the main reason for curtailment of CT in the control group was detention days (99%). The average potential CT for the control group was 637 days ($SD = 324$)

and for the control group it was 663 days ($SD = 283$). There was no significant difference in potential CT between the intervention and control groups ($p = .083$).

Discussion

The current findings support the hypothesis that the ForACT intervention, when embedded in a continuum of care for internees, leads to significantly fewer new arrests or new incarcerations compared with other types of community-based care. Even when we corrected for the main factors related to arrests or incarcerations, participants in the ForACT group were over six times less likely to experience arrests, and just under 14 times less likely to experience incarcerations. The overall arrest rate in the intervention group was 2.8% over 33 months, which compares well to ForACT rates reported in the literature, which range from 5 to 60% over 1–5 years (Parker 2004; Smith et al. 2010; Solomon and Draine 1995). The incarceration rate of 4.3% for the ForACT group was low and accords with previous research, which has reported incarceration rates as low as 0% (Jeandarme et al. 2015; Parker 2004).

In contrast, we found a very high hospital admission rate for the ForACT group; 50% of patients had at least one admission during follow-up. Previous ForACT studies have also reported high admission rates of up to 19% over 2 years (Simpson et al. 2006). Most of the admissions in the current study (70%) followed substance use, which suggests that admissions are used as a way to manage the risk created by the use of illegal substances (mostly illicit drugs). This high admission rate highlights several issues. First, the ForACT team relied heavily on the availability of hospital beds, which was possible because the participants were embedded in a continuum of care. In contrast, patients in the control group had almost no admissions, yet a much higher incarceration rate. We suspect this resulted from a combination of patient reluctance to seek help and accept admissions and a reluctance in residential settings to admit internees who are often unmotivated and perceived as dangerous by the time they require admission. This hypothesis is supported by the high rate of patients in the control group re-entering prison for reasons other than new arrest. The primary reason for new detentions in this group was a breach of conditions (i.e., missed appointments and substance use). These findings suggest that effective community-based care for internees needs to be embedded in a broader continuum of care that can offer crisis back-up.

Second, the high admission rate highlights the importance of treatment for substance use, which is in accord with previous findings on admissions in forensic populations (Cosyns et al. 2008; Greenberg 2014; Manguno-Mire et al. 2014). In the ForACT group, substance use was a

decisive factor in poor CT, and, conversely, in successful trajectory during follow-up; it was also the reason cited for interruption of follow-up in all such cases. Even though the team offered integrated dual diagnosis treatment, the risk that accompanies new substance use often oriented the decision toward (short-term) admission. To improve CT and to reduce the number of patients for whom follow-up was interrupted, new strategies need to be developed to contain substance use and the subsequent risk in ForACT projects (De Witte et al. 2014; Drake and Latimer 2012; Drake et al. 2001; Greenberg 2014).

Third, the high admission rate meant follow-up of the ForACT participants was intense and required flexible staff. Patients progressed through the continuum of care; however, even after admission into a closed ward followed by admission into an open ward, living in the community proved to be a great challenge for many participants. Overall, CT in the intervention group was significantly better than in the control group. We found an average CT of 80% over 33 months for the ForACT group, which is in accord with the CT of 80% found by Parker (2004) over 5 years. Curtailed CT in the ForACT group was mostly owing to hospitalizations; CT in the control group was mainly curtailed by time spent in lengthy detentions. The residential setting in the continuum of care allowed short, protective, admissions for patients in the ForACT group. In contrast, patients in the control group who entered prison had trouble getting released, which affected their CT substantially. Prisons did not allow the same flexibility as did the residential part of the continuum.

Strengths and Weaknesses

To our knowledge, this is the first controlled study to investigate ForACT in a continuum of care. As such, these findings provide new information on this topic. Additionally, we were able to use CT as a controlled outcome measure. The main flaws of the study are the sample size and follow-up time. A longer-term study of the effects of the intervention, with larger samples, is needed. In addition, we used a logical, yet stringent definition of arrests, which might have limited the measurement of the real number of incidents occurring during follow-up and might have excluded incidents that did not fit our definition. This issue should be addressed in future research. Although we did manage to obtain a control group, randomization was not possible because the CPS could not be blinded. As such, the decision of the CPS to enter patients in the care-continuum or directly in the community, was a bias. We adapted to this by controlling for the main variables that are related to the outcome measures, to reduce the effect of the decision made by the CPS.

Also, the control group and the experimental group did differ on the presence of an antisocial personality disorder and of a substance use disorder, so we did control for the presence of the both of them. Lastly, the judicial environment of the US is quite different from the Belgian situation regarding decisionmaking and follow-up of mentally ill offenders. As such, the generalisability of our findings are limited and replication is needed within different judicial systems, such as the US.

Conclusions

In conclusion, the current study provides evidence of the effectiveness of a ForACT when embedded in a continuum of care. ForACT was significantly more effective than other types of community-based care on all forensic outcome measures. In contrast, the ForACT group showed a high hospital admission rate, mainly because of a small number of patients who continued to use substances. Consequently, good back-up from residential care was essential to avoid incarcerations. Although the hospitalization rate was high, admissions were short, with a median of only 7 days.

To our knowledge, this study is the first to compare CT in an intervention and control group. We found that patients in the ForACT group had significantly better CT than those in the control group. In nearly all cases, curtailment of CT in the ForACT group was owing to hospitalizations; in contrast, patients in the control group experienced new and lengthy incarcerations. Therefore, the continuum of care was effective in keeping people out of prison. Future research needs to investigate ways to target the small group of patients who either have a high admission rate, or for whom follow-up by the ForACT team was interrupted. It is clear from these findings that addressing substance use in this group will be particularly challenging.

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Compliance with Ethical Standards

Conflict of interest All authors certify responsibility for this manuscript. There are no conflicts of interest to be reported.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the Ethics Committee of the University of Antwerp with the number BE300201628708. The study was also done with the written authorisation of the Belgian prison system (EPI).

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